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THE AFTER-CARE OF POLIOMYELITIS AS A PUBLIC PROBLEM

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No recent event in medicine has caused more anxiety than the epidemic of poliomyelitis during the summer of 1916, which became a panic in certain localities. Moreover, the history of the 1907 epidemic and similar records give reason to fear extensive recurrences of the disease during the next two years.

While the subject of prevention is one of great importance and public interest, what now demands serious consideration is the care of the wreckage left after the epidemic. It is this problem that I desire to discuss. I shall speak (1) of the extent of recent epidemics, (2) of the inadequacy of the ordinary facilities for providing the requisite care, and (3) of plans suggested for meeting the existing needs.

During the past summer there were reported to the health authorities in the United States no less than 27,000 cases of poliomyelitis. About one half of these occurred in the state of New York. The other states in which the epidemic was most severe, in the order of the greatest relative prevalence, were New Jersey, Connecticut, Massachusetts, Minnesota, Delaware, Rhode Island and Pennsylvania. In only four states — Nevada, New Mexico, Georgia and California — were no cases reported.

An official analysis[1] of the New York City cases was made in October. This showed that the fatality had been about 26 per cent. Of 2,715 patients who recovered and were investigated at their homes, 65 per cent. showed a "serious paralysis of one or both lower limbs" and were "unable to walk," and 19 per cent. more "were partially paralyzed in the lower limbs, although still able to walk." These figures from New York City give a scale by which one may measure the whole group in a general way, for the figures will probably not differ materially wherever they may be taken.

It need hardly be said that no such prevalence of the disease has ever been recorded, and that the statement occasionally heard that there has not been much more poliomyelitis than usual this year and that it is really a newspaper sensation is wholly misleading. It is obvious that these thousands of paralyzed children constitute a humanitarian and economic problem of no mean dimensions — a problem which must be defined a little before we proceed farther.

Poliomyelitis leaves behind it, in many cases, a paralysis which is of itself disabling, and which, if neglected or badly treated, often leads to serious and disabling deformities. These deformities are preventable, with the exception of those affecting the spine and shoulder, by treatment. In carrying out this treatment we are striving to prevent deformity and disability, which necessitates a struggle lasting over years. Muscles in most instances are weakened rather than totally paralyzed, and the fate of many of them depends on whether in the first year they are protected from fatigue and stretching, and are carefully exercised, massaged and, if need be, supported, under which favorable conditions they may recover; or whether the children are allowed to go about as they will, without efforts to develop muscular strength and without careful therapeutic supervision, in which case the muscles are not likely to recover, and deformities are liable to result.

If a modern industrial enterprise had to meet the problem of treating these children properly now or carrying them through life as dependents, there would be no doubt about the financial and economic aspect of the matter, and prompt care would be provided.

The dangerous time in infantile paralysis from an economic point of view is not in the first two or three months after the attack. That period has its dangers, but in the only three states of which I have first hand information — Vermont, New York and Massachusetts — the disease in this period is efficiently and carefully treated by the general practitioner. In 1,700 cases of this year's epidemic recently seen in New York state there have been very few cases in which any preventable deformity, even a dropped foot, had occurred, and not one case in which was found evidence of neglect on the part of the attending physician.

At the end of from three to six months, however, there begins a period which lasts for years, during which time many a patient acquires needless, lasting and perhaps disabling deformity. As an instance of this, at one of the recent New York clinics among forty patients there were three who will illustrate this point. One was a little girl, affected three years previously, whose parents were poor, but who had spent a great deal of money on irresponsible fakers. She had acquired a badly overextended knee and could barely walk. The condition can be remedied by a brace costing about $5. Two boys had been quadrupeds for nine and seven years, respectively. They walked on all fours like monkeys. One went to school and went about the class room in this way; they could go up and down stairs and about the house, but always as quadrupeds. One needs a pair of braces, a corset and crutches to walk like a human being, at a cost of not over $25. The other needs a preliminary division of some shortened muscles, which will keep him in bed about six

1. New York City Bulletin of Health, Oct. 23, 1916.

weeks, after which, with the apparatus mentioned for the other boy, he can go about.

With regard to the general problem, two states — New York and Massachusetts — have answered that in their opinion the situation requires special measures. To these should be added a third and pioneer state — Vermont — which decided in 1914 that an epidemic of about 300 cases was severe enough to warrant state care and supervision, which has been in effect there since January, 1915.

The state-wide care of this disease is new, but in Vermont it has seemed efficient. It has perfectly clear reasons for its adoption, just as there are certain objections to it which can easily be formulated.

The conditions to be met in rural communities and in the small cities, in which there are few, if any, dispensaries, no orthopedic workshops, special hospitals or clinics, are different from those in the large cities, in many of which all of these things are available. The question, therefore, will be discussed from both of these standpoints.

RURAL COMMUNITIES

A case occurs in a rural community, or in one of the smaller cities. It is well and efficiently cared for by the family physician for from three to six months, but the child remains paralyzed. If the parents are rich, the child can be sent to the city and obtain the advice and treatment of a specialist. But if they are poor, what can the physician do? He has carried the case through the early dangers; he has so far prevented deformities, and he is now faced with the necessity of formulating the future treatment of the case. He can send to the city and order apparatus, but it may not fit, and he must leave the design largely to the instrument maker. The physician cannot furnish massage or muscle training because there are no experts available, and often he decides to settle down to the routine use of electricity in the hope that it may do some good and because nothing else seems available. Finally he and the patient may drift apart, and the latter either does nothing or seeks the aid of fakers who take his money and give him nothing worthy of the name of treatment. This happens again and again in rural and suburban communities, less often in the cities, and the family physicians deplore the situation as much as any one.

As a result of this situation, deformities, sometimes of the most disabling type, may occur; the patients may become bedridden and distorted; being no longer wage earners, many of them become a burden on the family or on the state. Apart from any humanitarian aspect, it is an economic blunder to let this happen on a large scale.

IN LARGE CITIES

Take next the paralyzed child in the large cities which are adequately equipped with special hospitals and dispensaries. How is he likely to fare? The modern treatment of the after-results of poliomyelitis does not consist in putting on a brace and telling the parents to let the child walk as much as he can and to return when the brace is worn out or no longer fits. The dispensaries are quite adequate to carry out this sort of treatment on a large scale, but this does not meet the situation, and the time has come when we should do better.

Certain patients are so lightly affected that they will recover, no matter how inefficient the treatment. Others are so extensively paralyzed that no treatment will have any great remedial effect; but in the bulk of cases in my experience the ultimate function is greatly influenced by the character, efficiency and continuity of the treatment in the first two years. If the patient is to benefit from careful modern treatment at the dispensary, he must report regularly and continuously. First comes the question of carfare, often a burden to poor families. This expense may be avoided by providing ambulances to carry children to and fro; but the number of ambulances required to cover adequately New York City, for instance, in the present emergency would be very great. Second, the time consumed in the trips is a tax on the mothers of large families. It is difficult, therefore, for these and other reasons to secure long continued and regular attendance at dispensaries. At first the patient is taken to the dispensary with more or less regularity, and receives good or bad treatment, according to the dispensary which he attends. But whether the treatment is good, average or poor, the progress of the recovery from the paralysis is in most cases slower than the parents desire and expect, and in time many of them drift away seeking other dispensaries. The unintelligent ones turn to the fakers, and others become discouraged and abandon treatment, making up their minds to accept the paralysis as a misfortune which is beyond remedy. In this way many become hopeless cripples quite unnecessarily. An adequate follow-up system is a help in minimizing this condition. Dispensary attendance to be of therapeutic value must go on week by week, month by month and year by year if satisfactory results are to be obtained.

Again, in epidemic centers the special dispensaries will in the months following the epidemic be greatly overcrowed, a condition which will inevitably lessen their efficiency. Adequate treatment demands a thorough examination, and in each case of poliomyelitis a correct muscular diagnosis can be made only by an examination of each accessible muscle or muscle group in both arms, both legs, back, abdomen and neck. This takes time and care as well as experience and skill.

Continued residence in a hospital has been advocated by some persons, but such residence to be effective must go on for two or three years in order to cover the dangerous period. The objections are obvious: (1) Few parents would consent, (2) an enormous number of beds would be required and would be taken from patients with acute cases, (3) the scheme is expensive, and (4) such radical measures are wholly unnecessary.

Having thus presented the disadvantages of the dispensary and hospital solution, I turn to that solution which seems to me to be the most satisfactory and most generally applicable both to urban and rural communities, namely, the home care of the patient.

The practical aspect of this question — the question of how to meet the problem in a rural community — was presented to me in a concrete form in Vermont in 1915. I had been requested by the Vermont State Board of Health to undertake the after-treatment of about 300 patients paralyzed in the summer of 1914. These patients were scattered through the northern half of the state, many of them living in the country on farms and in the mountains. There were no special hospitals or clinics in the state, and the only available means of dealing with the cases seemed to be to assemble the patients at clinics in five centers. At these clinics each patient was thoroughly examined by me, with the aid of one muscle trainer, in consultation with the attending physician, who was generally

present. If apparatus was needed, it was measured for by me, made under my direction and sent to the physician. If muscular exercises were needed, they were formulated at the time of the examination, and the mother was taught to give them and received written instructions describing them. The family and the physician were warned of the bad effect of fatigue, and the whole situation was discussed and emphasized before the patient left the clinic. The usual arrangement was that the mother or father was to give the exercises, and the physician was to supervise the treatment. After these clinics no attempt was made to hurry, and the patient received quite as much time and attention as in private practice. If the family physician was not present, a letter was written to him describing the case and the treatment advised, and in every case a copy of the record was sent to him. If apparatus was necessary and the parents were too poor to pay for it, it was partly or wholly paid for out of a fund at the disposal of the state board of health. If operation was necessary, it was arranged for at a local hospital or elsewhere. No follow-up nursing care was attempted at this time, because no one sufficiently skilled in muscle training was available. There the plan rested, and no further clinics were held until July, 1915, six months after the first series, when I went to the same places and held a second series of clinics. The results were surprisingly good, and to my astonishment seemed on the whole better than results from routine dispensary treatment. The crude plan worked out to meet a special emergency had succeeded.

At this time a woman skilled in muscle training was secured and left in Vermont for the summer, visited it at intervals during the winter, and lived there during the summer of 1916. She made rounds of the centers, visited the parents, encouraged the mothers and kept them up to their work, talked with the physicians, reported delinquents and defects in apparatus, kept patients away from the quacks and charlatans, and changed exercises when necessary. Although highly efficient and working to the limit of her strength, she could not keep track of all the cases, and a resident qualified assistant is now to be employed.

As a result of this work in Vermont, directed by the board of health, many children have been prevented from becoming cripples and from acquiring needless and often disabling deformities, the families have become intelligently interested in the treatment, and the physicians have without exception cooperated, and have become interested in the after-care, as a result of which, I believe, they have become better equipped to treat these cases than most general practitioners in the large cities.

A third series of clinics was held in July, 1916, from which certain data were obtained, which have been published,[2] and it is the purpose of the board of health to continue as long as necessary the supervision and treatment of these patients.

Such is an account of a pioneer attempt to carry out state care of poliomyelitis patients on a simple scale.

In the autumn of 1916, the state department of health of New York decided to undertake the treatment of the cases in New York State outside of New York City, following the Vermont plan, and I was asked to inaugurate and supervise the work, which began, Oct. 17, 1916, at White Plains.

Clinics are given at centers selected according to the grouping of the cases, and four clinics each week are held. Associated in the work are Dr. Armitage Whitman of New York and Dr. John T. Hodgen of Boston. Under them are several highly skilled nurses who have been taught muscle training, and two crews of two women each, experts in spring balance muscle testing, because quantitative studies are deemed a most important part of the work.

To follow up the after-treatment of the cases, nurses who are skilled in muscle training are left behind, one in a district, to work under the physicians and see that the treatment prescribed is followed, that exercises are done as ordered, that such exercises are modified as need arises, that apparatus is worn, that fatigue is avoided, and that patients report at subsequent clinics.

To replace these nurses who are dropped in the districts, new nurses are taken on to travel in the unit, there to be educated in muscle training and in their turn left behind in a district. As soon as the first round of clinics is completed, which will have taken nearly three months, a second series of clinics will be held in the same places, and the treatment will be modified as necessary. Such a scheme to be productive of the best results cannot be finished in one year, but must go on for two or three years, and possibly for a longer time.

In Massachusetts, where the epidemic started later than in New York, the Harvard Poliomyelitis Commission was requested by the state department of health to assume the responsibility of the after-care of the cases of paralysis in the state, and in November, 1916, undertook this in addition to the purpose for which it had been originally appointed, namely, to aid in the diagnosis and treatment of the acute stage and to undertake the study of the etiology of the affection.

Here the Vermont plan, in a somewhat modified form, is again being followed. The Children's Hospital, by the generosity of an anonymous donor, has been enabled to open a special clinic for the treatment of poliomyelitis, which has been designated as the central clinic of the commission, with which certain other clinics cooperate. This is intended to serve the area within 20 miles of Boston. For the other parts of the state, clinics will be held at different centers, following the same plan as in Vermont and New York.

New York City has appointed a committee on the after-care of poliomyelitis, and various other municipalities have inaugurated public clinics. The state of Minnesota also is considering a campaign of a similar sort.

The essentials for state or city care are:

1. A traveling or stationary unit headed by one or more surgeons, which may be taken to the affected centers where free public clinics are held. The visiting surgeon acts as consultant to the family physician and deals with the cases through him.

2. Sufficient time given to each clinic to secure adequate and thorough examination, and careful formulation of treatment by the surgeon and skilled assistants.

3. Follow-up care in the homes by highly skilled women, who supervise the muscular exercises, encourage the families, see that the family physician's instructions are followed, and that the patients are kept from falling into the hands of charlatans.

2. Lovett, R. W., and Martin, E. G.: Certain Aspects of Infantile Paralysis, with a Description of a Method of Muscle Testing, THE JOURNAL A. M. A., March 4, 1916, p. 729.

4. Subsequent clinics held in the same place at intervals of three months or more over a period of at least two or three years.

5. A copy of each record filed with the state department of health or central directing committee.

The advantages of the plan are: Special advice and treatment become available to all patients; the families are enlisted in the care of their children and share the responsibility; the family physician is assisted and not superseded; skilled assistance in after-care is provided over an indefinite time by those specially trained; the patients are kept under supervision; the clinics are educational to the profession, and the expense is not excessive.

The objections to the plan are: Like all schemes of state care it savors of paternalism; it is difficult to convince the community and the profession that such elaborate and long continued measures are really necessary; it has long been the custom to regard infantile paralysis as a chronic affection, on the whole hopeless, best treated by braces, with perhaps massage and exercises which any nurse or masseuse can give. One of the most serious obstacles to the scheme is the difficulty of making it understood that muscle training in poliomyelitis is a delicate and serious matter requiring much skill and experience. A simple explanation will show this. A child is left with certain muscles in a limb normal and many weakened. If exercises of an inaccurate character are given, the child inevitably uses the strong and not the affected muscles, and the strong muscles become overdeveloped and the weak ones are not used, so that the resulting condition is worse than if nothing had been done. Loosely given muscular exercises are dangerous and harmful. The person directing the exercises must know enough functional anatomy to prescribe such as will exercise only the weak muscles, a task far beyond the ordinary masseuse or nurse who has not had special training.

The question of how far the financial burden should fall on the state and how far on private individuals is a delicate one, but as a matter of record most similar new enterprises of state-wide importance in America have first been partly or wholly cared for by private benefactions. This is not the time to hesitate about a theoretical matter of this sort. Any plan will require expenditure of money, and to be adequate must be formulated and put into effect promptly in the most seriously affected communities; consequently, private funds must be employed. Since delay means disability, deformity and incapacity to so large a number of children, no affected community is likely to hold back long if a satisfactory plan for relief is presented.

One danger deserves comment, namely, indiscriminate giving to independent enterprises not correlated to the main one. A sound plan is the first essential, administered by the state or city or capable private interests, and to this plan should be tributary and related special funds.

SUMMARY

I have tried to show that the number of paralyzed children among us demands an increase in our existing facilities for relief; that the problem affects both rural and urban communities; that dispensary treatment and hospital residence have defects; that state or city care offers a more satisfactory solution and has proved efficient in Vermont; that the Vermont plan is being tried in other states, and that to be successful the plan must have related and subordinated to it independent organizations for relief.

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BACTERIAL FINDINGS AND THEIR RELATIONSHIP TO PYORRHEA ALVEOLARIS AND INTERSTITIAL GINGIVITIS *

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Few subjects in medical history have given rise to more frequent controversies than the inflammatory diseases of the gums. The classification, nomenclature, pathology, even the anatomy of the parts involved have afforded material for protracted argument. Probably no phase of the subject has been more keenly discussed than the etiology, and during recent years much of this interest has centered on the part played by bacterial invaders.

The probable relationship of pathogenic bacteria to the development of pyorrhea has been recognized for several decades. Mallasez and Galippe[1] (1884), Black[2] (1887), Miller[3] (1889) and Kirk[4] (1898) were some of the early investigators of its bacteriology. A variety of organisms were described, none of which could be specifically associated as the causative factor. Probably the first to ascribe etiologic significance to any particular micro-organism was Arkövy[5] (1904), who attributed acute cases of alveolar suppuration to streptococcic infection.

A detailed review of the voluminous literature on the bacteriology of pyorrhea and allied conditions appears neither necessary nor desirable. Many of the reports were based on studies the scope of which was limited both by the paucity of cases under observation and the facilities and training for their intelligent investigation. It seems advisable rather to try to correlate the facts established by those investigators who have definitely contributed to the bacteriology of the disease.

Perhaps the most notable of the early studies on the relationship of micro-organisms to the pathology of pyorrheal diseases is that of Goadby.[6] His first report in 1907 described a variety of organisms occurring in connection with pyorrhea, to none of which it was possible to attribute a definite etiologic relationship. This group of organisms included, in addition to the pyogenic cocci, various types of bacilli and spirilli. Curiously enough, in view of later developments and the fact that a study of his protocols shows that streptococci and staphylococci were found much more frequently, Goadby appeared to attach considerable importance to the bacillary forms. In 1908 Goadby reported the successful treatment of two acute cases of pyorrhea alveolaris with autogenous vaccines; in one of these the infection was mixed streptococcus and *Staphylococcus albus*, and in the other streptococcus was present almost in pure culture. In 1909-1910 a supplementary study of seventy cases was reported, in which the findings are given in Table 1.

During the period from 1907 to 1912 articles dealing with the bacteriology of pyorrhea were contributed by numerous workers, among whom may be mentioned Carmalt-Jones and Humphrey,[7] Sims,[8] Eyre and

* Read before the Section on Stomatology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Mallasez and Galippe: Compt. rend. Soc. de biol., 1884.
2. Black: Indep. Pract., New York, August, 1887.
3. Miller: Die Mikroorganismen Mundhöhle, Leipzig, 1889.
4. Kirk: Dental Cosmos, 1898.
5. Arkövy: Brit. Med. Jour., 1904, **2**, 1371.
6. Goadby: Brit. Med. Jour., Sept. 9, 1905; Tr. Odontological Soc., March, 1906; Lancet, London, March 9, 1907; Brit. Med. Jour., Aug. 22, 1908; Lancet, London, Dec. 25, 1909; Practitioner, London, 1912, **88**, 107.
7. Carmalt-Jones and Humphrey: Lancet, London, Dec. 28, 1907.
8. Sims: Dental Practitioner, Toronto, October, 1908.

Payne,[9] Fletcher,[10] Beebe,[11] Best,[12] Williams,[13] Logan,[14] and Leary.[15] The results of their investigations were diverse and do not materially assist in clearing up the confusion existing relative to the bacteriology of the disease. The only deduction which they justify is that a number of microorganisms, potentially pathogenic, may under certain conditions be isolated from suppurative lesions of the gums.

The possibility of spirochetes being concerned pathologically in pyorrhea has received some attention.

TABLE 1.—ORGANISM FINDINGS IN SEVENTY CASES OF PYORRHEA ALVEOLARIS

Organisms	No. Cases Present
Streptococcus	19
Pneumococcus	5
B. necrosis-dentalis	14
M. catarrhalis	23
B. septus	15
Staphylococcus aureus	12
Saccharomyces	5
Micrococcus citreus-granulosis	6

Various workers, including Noguchi, have described spirochetal types found in the oral cavity, and in 1912 Noguchi[16] isolated, in pure culture, from a case of pyorrhea a mucin producing spirochete which he named *Treponema mucosum*. This organism is not regarded by Noguchi as strictly parasitic, but he ascribed to it pyogenous action under conditions in which the tissues have been so injured as to enable it to survive. The strong fetid odor in some cases of pyorrhea he believes to be due in part at least to the presence of *T. mucosum*.

Recent bacterial studies which seem to be entitled to careful consideration are those reported by Medalia,[17] Brown,[18] and Hartzell.[19]

Medalia's reports were based on a study of 115 cases, in which a careful bacteriologic investigation appears to have been carried out. The series included fourteen incipient, sixteen moderately advanced, and eighty-five advanced cases. The findings reported are as given in Table 2.

We would be led to infer from these results that the pneumococcus is the most important organism to be considered, as it was found either alone or in combination in 107 of the 115 cases (93 per cent.), and the streptococcus only an occasional invader, as it was reported as being present in only fourteen cases (12 per cent.). The work of other investigators does not, however, substantiate this deduction. Brown in forty-eight cases observed *Streptococcus viridans* twenty-three times, hemolytic streptococci thirty times, and nonhemolytic streptococci twenty-eight times. Pneumococci were present in twenty-seven cases, staphylococci, diphtheroids and organisms of the *Bacterium influenzae* group being also frequently found.

Hartzell's work, perhaps the most convincing of any that has been reported, points strongly to the importance of the streptococcus in pyorrhea. His observations have indicated that approximately three fourths of the bacterial content of pyorrhea pus pockets is made up of pyogenic cocci of the *Streptococcus viridans*, and staphylococcus types, and the remaining one fourth of other organisms. Hartzell's animal inoculations have shown that following the intravenous injection of pus from pyorrhea pockets streptococci of the viridans type are usually recovered, occasionally staphylococci.

Personal observations relative to the occurrence of streptococci, staphylococci and pneumococci in pyorrhea would place streptococci first in frequency, staphylococcus next, pneumococci being observed in only a small percentage of cases.

The scope of this paper does not extend to a consideration of the relationship existing between pyorrhea and systemic diseases. The importance of oral infection in metastatic infections of the heart, blood vessels, joints, kidneys and other tissues is, however, generally recognized. Hartzell has emphasized the fact that of the organisms found in the mouth, there are none having the varied possibilities for disease production characteristic of the streptococcus group. Clinical observations as well as the results of animal inoculations have clearly shown that in the remote pathologic effects of oral infection, the streptococcus overshadows in importance all other organisms which may be present in pyorrhea pockets.

A discussion of the causative factors in pyorrhea necessarily involves a consideration also of its pathology. Considering interstitial gingivitis and pyorrhea alveolaris as phases of the same disease, we generally recognize that bacterial invasion is characteristic of the pus stage and is not necessarily present in cases of interstitial inflammation without pus. The bacterial studies which have been reported are based largely on investigation of cases of the purulent type. The occurrence of gingival inflammation, without infection, as the result of trauma, irritation and constitutional influences during the nonpurulent inflammatory stage of the disease is scarcely open to question. On the other hand, the conclusion of some investigators that bacterial invasion in pyorrhea is invariably a secondary factor, infection being universally absent prior to the pustular stage of the disease, does not seem to be established. An infected zone around the root of the tooth, usually due to acute streptococci infection, may exist. It would be strange indeed if this were not so, since the poorly protected gingival crevice offers a splendid opportunity for bacterial attack, the microbic penetration being aided by the formation of calculi on the roots of the teeth or at the gingival margin and

TABLE 2.—BACTERIAL FINDINGS BY MEDALIA IN 115 CASES OF PYORRHEA ALVEOLARIS

	No. Cases with Organisms	Per Cent.
Incipient Cases (14)		
Pneumococcus and staphylococcus	10	71
Pneumococcus	2	14
Staphylococcus and streptococcus	1	7
Sterile	1	7
Moderately Advanced Cases (16)		
Pneumococcus and staphylococcus	8	50
Pneumococcus	6	37
Staphylococcus	1	6
Sterile	1	6
Far Advanced Cases (85)		
Pneumococcus and staphylococcus	49	57
Pneumococcus	18	21
Staphylococcus	1	1+
Pneumococcus and streptococcus	3	3+
Pneumococcus, streptococcus and staphylococcus	10	12
Pneumococcus and Micrococcus catarrhalis	1	1+
Staphylococcus and Micrococcus catarrhalis	2	2+
Sterile	1	1+

9. Eyre and Payne: Proc. Roy. Soc. Med., Odontological Section, Nov. 22, 1909.
10. Fletcher, M. H.: Unclean Mouth and Its Evil Results, THE JOURNAL A. M. A., July 13, 1912, p. 94.
11. Beebe: Boston Med. and Surg. Jour., Oct. 28, 1909.
12. Best: Dublin Jour. Med. Sc., **133**, 91.
13. Williams: Am. Jour. Med. Sc., 1911, **112**, 666.
14. Logan: Dental Rev., 1911, **25**, 649.
15. Leary: Dental Cosmos, 1909, p. 55.
16. Noguchi: Jour. Exper. Med.; 1912, **16**, 194.
17. Medalia: Boston Med. and Surg. Jour., 1912, **167**, 868, 922; Dental Cosmos, January-February, 1913.
18. Brown: New York Med. Jour., 1915, **98**, 1201.
19. Hartzell: St. Paul Med. Jour., 1916, **18**, 77; Report First District Dental Society of the State of New York, Jour. Allied Dental Societies, March, 1916.

the number of the infecting organisms being augmented by the neglect of oral hygienic measures.

The tendency to consider any etiologic factor in pyorrhea as an entity instead of in relationship to other influences is unfortunate. Irritation, trauma, metabolic disturbances and microbic invasion constitute a vicious circle in the development of alveolar diseases. The bacterial element is probably the most important element in the destructive tissue changes and certainly so in the serious sequelae. While it is impossible definitely to classify interstitial gingivitis or even pyorrhea as primarily a microbic disease, the pathology is intimately associated with the results of bacterial invasion and the adequate consideration of its treatment must necessarily recognize the importance of the infectious element.

THE ROENTGEN RAY IN THE DIAGNOSIS OF PYORRHEA *

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Roentgenography for the demonstration of pyorrhea alveolaris does not differ in its technical plan from that used in other procedures intended to shed light on diseases located in the jaw bones. The constant feature of the disease which makes its demonstration by roentgenoscopy possible is the ulceration of the presenting margins of the alveolar process and the more intimate bone about the roots. In general the extent to which this marginal bone is found to be eroded is the measure of the extent of the disease recorded on Roentgen-ray films or plates. The relative simplicity of a Roentgen-ray procedure which is required to show only the height or depth of a bone profile in so thin an object as the human jaw is quite apparent, and in reality no such rigid technic is necessary in pyorrhea as in the demonstration of periapical disease, in which a focus of minor decalcification must be detected in and surrounded by a considerable mass of bone of variable and often complex structure.

This rough delineation of the general present depth of the process with respect to the dental roots in a case of known pyorrhea is therefore a relatively simple problem, and in itself is scarcely deserving of a lengthy dissertation. But in any series of pyorrhea cases the general roentgenographic survey is capable of bringing to light some of the minor changes about the roots of individual teeth, such as the localized or beginning extension of the disease toward a given apex, the softening of the adjacent alveolar wall due to an early inflammation of a single peridental membrane—the signs, in short, of the early and deeper encroachments of the disease which are so important in the complete diagnosis and prognosis of a pyorrhea case. For the detection of these minor but most important changes in the bony investments of the teeth only the most critical roentgenography is of value, and this must be combined with a careful and intelligent reading.

In roentgenograms of the normal denture, the spongy bone of the jaw uniformly envelops the dental roots and proceeds fully up to the point of attachment of the peridental membrane. In the most critical roentgenograms, the shadow of this spongy bone is seen through the shadow of the dental root, but is most prominently visible in the septal bone. The septal bone is characteristically of triangular shape, with more compact bone at the marginal apex, and at this apex one often sees an apparent fusion of the white line surrounding the adjacent roots. This so-called white line is the shadow cast by the denser walls of the alveolus between which and the roots themselves is the slight space occupied by the peridental membrane.

It is well known dental pathology that in pyorrhea the primary site of bone liquefaction is in that bone immediately adjacent to the peridental membrane. For this reason it is so often seen in roentgenograms that the marginal line of persistent bone is wavy with the deepest erosions in juxtaposition with the teeth. Whenever in roentgenograms it is seen that a localized or deeper absorption has occurred, it must be admitted that no correct inference can be made as to whether this erosion lies primarily on the labial, buccal or lingual aspect of the process. There is seldom seen in the most critical roentgenograms a double marginal line which could be known to represent, respectively, the inner and outer limits of erosion, and even where the double line is seen, it is impossible to distinguish the inner from the outer. Moreover, the film method calls for the projection of the light at such angles that, while the teeth show with minimum distortion, there is a palpable displacement on the film of the position for attachment of the peridental membrane externally with respect to its internal attachment. Should, therefore, the double line be visible in every case, a correct interpretation would involve a reasonable discount for angular displacement. For this reason, the most accurate and comprehensive portrayal of the exact position and the extent of the erosion is often obtained by the stereoscopic method, in which the stereoscopic shift is made along a vertical line rather than along the usual horizontal line, for reasons apparent to those versed in stereoscopic roentgenography in general. To obtain the most valuable average line as a gross measure of the ulcerative process, roentgenograms may be made at a considerably lower angle than for demonstration of the apexes, although an elongation of the dental shadows themselves will result.

Whether or not the general line limiting the ulcerative process can be followed across the shadows of the roots themselves, it will usually show plainly in the region of the septal bone. Wherever the teeth are normally spaced and the septal bone abundant, the marginal dissolution at the interspaces is very plain. In case the teeth are closely crowded and the septal bone small in amount, or when for any cause the ray angle used in the exposure was such that a lateral overlapping of dental shadows has resulted, the depth of septal bone is indeterminate. Inasmuch as the septal bone erosion is usually less than that in the immediate vicinity of the peridental membrane, the amount of septal destruction is not to be taken as the true limit of the encroachments of the disease on the jaw. Rather, this must be based on a careful observation of the integrity of the bone enveloping the peridental membrane farther toward the apex. Often a lateral or circumferential absorption can be followed deeply toward the apex. This appearance denotes a localized pyorrhea pocket, and is often concentrically funnel shaped. In conjunction with this funnel shaped dissolution, which extends around the tooth to a greater or less depth beyond the line of septal erosion, is often seen a more delicate partial decalcification of the

* Read before the Section on Stomatology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

white line extending to and around the apex, together with a slight widening of the space occupied by the peridental membrane itself. This finding is the premonitory sign of the inflammation of peridental membrane which precedes extension of the funnel shaped pocket to and around the apex. It is now only a matter of a short time till the entire depths of the root are surrounded by the liquefied products of the ulcerative pericementitis.

The limitations in the value of the Roentgen findings in any disease should also be mentioned. While the Roentgen findings in pyorrhea as a rule agree very well with findings elicited by a digital or instrumental examination, and are obtained with far less discomfort to the patient, there are certain respects in which they are disappointing. Let me mention a few of these: Sometimes a pyorrhea tooth is quite loose, and a well defined pocket is expected in the roentgenogram. Instead, it may require a stretch of the imagination to find in the roentgenogram more than a simple loss of the normal white line. This is undoubtedly because the atrophy which has occurred is diffuse and poorly demarcated. Again the tooth shows no looseness on examination, and the roentgenogram shows the deepest kind of a pocket. This apparent discrepancy is undoubtedly due to the escape from the disease of a limited portion of the investing structures, not recognizable roentgenographically, but sufficient in amount to maintain the stability of the tooth for the time being. A very important point in the diagnosis may be entirely undemonstrable by Roentgen methods, and I refer to the activity of the disease at the time of examination. Quite frequently roentgenograms are essentially similar in cases in which gross amounts of infective material can be expressed from the jaw to those in which the disease in all its clinical manifestations is entirely quiescent or advancing at a very slow rate. It may be sufficient to mention the general roentgenographic fact that in an ulcerative process in which bone shadows show partial or poorly limited decalcification, the process is in an active or rapidly progressive stage, whereas in well demarcated cases, in which areas of complete liquefaction lie directly adjacent to areas of undisturbed bone, the process may be considered more chronic in type.

CONCLUSIONS

A general survey of the denture by a series of dental films is an important adjunct to the examination of a pyorrhea case. It is often a short cut to a diagnosis and is less disagreeable than an instrumental examination, but should supplement rather than displace other diagnostic methods. The most important diagnostic points are observable in the region of the intimate bony investments of the roots and are obtainable only from the most critical roentgenograms.

122 South Michigan Avenue.

Disposing of Sputum.—One of the problems in taking care of tuberculous persons is to dispose of the sputum, according to the *Sanitary Bulletin* of the Buffalo Health Department. Sometimes in chronic or advanced cases this amounts to a great deal, and when no furnace fire is available, its safe disposal taxes the ingenuity of the attendants. A nurse suggested a plan which is said to be effective and feasible. Provide a galvanized pail or garbage can and place in the bottom of it some charcoal. Place in this the sputum cups, cover with kerosene and take into the alley or yard and set on fire. The charcoal will hold the fire until everything is consumed.

THE IMPORTANCE OF A CORRECT DIFFERENTIAL DIAGNOSIS OF THE PREDISPOSING CAUSES

IN CASES OF INTERSTITIAL GINGIVITIS OR PYORRHEA ALVEOLARIS *

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Periodically, we are told that interstitial gingivitis, or pyorrhea alveolaris, is caused by some special organism which the writer has just discovered. Specific investigation and attempts to corroborate these vaunted discoveries have always proved them to be erroneous. We are just beginning to recover from the shock of how little we know about the *Endameba buccalis*. The fact that a prominent research worker in medicine proclaimed to the world that the endameba was responsible for every case of pyorrhea, and that this disease was present in 95 per cent. of our population, has been the direct cause of much confusion. Physicians lacking education in mouth physiology and pathology were especially imposed on by this dogmatic assertion.

Research work which I have conducted in the mouths of animals has corroborated the work of general observers to the effect that infection is impossible in an individual otherwise physically well. Considering, as we are, end-organ tissue, it must be admitted that unless prophylactic measures have been adopted, the so-called dental organs are the first to exhibit a diminution in immunity to infection, if any form of malnutrition is in evidence. If, by exercise, massage and other hygienic measures, the circulation in the ultimate capillaries is kept moving, the gums and peridental tissue will frequently retain their immunity, even though malnutrition is present.

Pyorrhea alveolaris is a result of malnutrition plus infection, and also most frequently plus irritation, and it is greatly intensified if arteriosclerosis of the ultimate capillaries sets in. Only daily observation of the dental tissues can make one familiar with the appearance of a normal mouth, and without this knowledge, it appears impossible for any one to differentiate the different appearances of these tissues in different diseases.

While all forms of pyorrhea must commence with some form of gingivitis, yet the tissues in this and all succeeding stages vary in clinical appearance as markedly as do the generic types of malnutrition which interfere with a proper equilibrium of the circulation. The blue line in the gums as a result of mercurial toxemia, and the mucous patches due to syphilis, are old landmarks in medical diagnosis. In like manner the physician awaits the eruptive stage in order to make a correct diagnosis as between smallpox and measles, or any of the other exanthems. It may, therefore, be asserted with assurance that the variations in clinical appearance of the gums and pericemental tissues point with unerring fidelity to the cause of the dyscrasia. When these are once read with the same assurance with which we now read the blue line, a great advance in the diagnosis of this disease will have been reached. When it is once duly appreciated that pyorrheal symptoms are a possibility at the very onset of any inter-

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ference with the normal action of any vital function, and that a proper reading of their clinical appearance will disclose at once the nature of the trouble, the study of the dental organs will be properly comprehensible, and not until then.

The fact that pyorrheal manifestations are very frequently observed, without the investigator being able to obtain any confirmatory diagnosis of some form of malnutrition, is generally due to the fact that impairment of the vital organs progresses very slowly, and that frequently with our present day methods it is impossible to make a correct diagnosis until the disease has reached an advanced stage.

When, finally, as the organic disease increases, a correct diagnosis is made, it is not uncommon to find that this organic disease is believed to be caused by the pyorrhea. The poor diagnostic sense of the uninformed dentist is the cause of this frequent error in diagnosis, this placing of the cart before the horse. While an abnormality of some important organ or organs of the body is generally the predisposing cause, we see other types of pyorrhea where the predisposing cause is the decrease in functional power of the teeth themselves. Here loss of teeth by extraction, irritation under the gingivae from unpolished fillings, and every type of malocclusion become the predisposing causes instead of their being caused by some organic disease.

Every dentist will corroborate the great variation in the mouth picture which presents itself in different pyorrheal cases. We see the case without any deposit on the root in strong contrast with those in which these deposits seem to overwhelm all the exposed root structure. We see the gum abnormally dry and parched in contrast to those cases in which the mucous follicles are constantly excreting varying quantities of fluids. There is the pale anemic gum in contrast to the ruby red inflamed gum. We find pockets under the gums free from suppuration or exudation, in contrast to those cases in which there are purulent discharges, and the gums are so inflamed and spongy in character as to bleed on the slightest provocation. There are cases in which the gingival border is atrophied to a knife blade edge in contrast to every type of hypertrophied tissue. The gums at times will be found in all possible shades of color, and in certain cardiac diseases there is a sharp division line between a normal pink and dark blue in the gums in the same mouth.

We find no such variation in symptoms in any infectious disease. Smallpox, tuberculosis, typhoid fever, measles, syphilis, yellow fever, diphtheria, etc., all possess well defined symptoms, which mark them unmistakably as the disease in question.

In interstitial gingivitis or pyorrhea alveolaris, the clinical appearance is but a reflection of the predisposing cause. Each different picture will always be found associated with one particular predisposing cause. A carefully recorded study of these different pictures will soon make the observant stomatologist familiar with at least some of the more common types of malnutrition, and after a time he can readily recognize them on sight.

It has been my good fortune, because of experience with these clinical pictures, to have frequently been the means of directing the patient in the early stages of some serious ailment in keeping with rational treatment. It is impossible to estimate too highly the value of such a diagnosis being made in an early stage. It is wrong for us to discuss this subject as though we were speaking of some specific disease instead of addressing ourselves to pathologic symptoms of one of many diseases.

The time will come, when the subject is under discussion, that it will be confined to the particular malnutrition causing a given type of pyorrhea. In 1894, I presented such a method of classification by prefixing or adding an adjective stating the name of the disease, which is causing the pathologic symptoms in the oral cavity, as "diabetic pyorrhea," "tuberculous pyorrhea," etc. Only under such a classification can rational discussion be held on this subject. Take, for example "nephritic pyorrhea" and "diabetic pyorrhea." While renal abnormalities occur in the predisposing cause in each type, nevertheless, the symptomatology and treatment should be entirely different in each type. When this point is conceded, due importance will thereafter be given to the necessity of making clear the nature of the predisposing cause of the cases under discussion.

It is well understood in general surgery that operative procedure is attended with great danger to life itself in patients suffering from diabetes not under control. Consequently, the same danger to life exists when surgical interference is commenced in pyorrhea when there is present an active condition of diabetes. The at one time well nigh universal habit of dentists using surgical intervention in diabetics without making any diagnosis of the predisposing cause has produced its quota of fatal consequences. In advanced stages of fatal diseases, it would be unnecessary brutality to subject the patient to the discomforts of surgery. On the other hand, when the disease is curable, it is of great importance that the stomatologist should be given an accurate statement by the internist of every body disturbance, so that all local treatment should proceed in therapeutic harmony with the general treatment.

Prognosis of pyorrhea or gingivitis must largely depend on the possibility of obtaining a cure of the malnutritional factor. It is for this reason that the results of all physical examination, etc., should be in the hands of the stomatologist, so that he cannot only work in harmony with the physician, but also keep accurate record of any tissue changes that may take place.

When the preponderating importance of an accurate diagnosis of the predisposing cause of pyorrhea is appreciated, an important factor in the maintenance of our point of view is established to the effect that the dentist treating these and all other mouth diseases should be as efficiently educated in general medicine as is the specialist in any other department of medicine.

38 East Sixty-First Street.

Heredity and Cancer.—A committee of the life insurance companies in cooperation with the American Society for the Control of Cancer in a recent investigation on various phases of the cancer problem, found, among other things, from the records of a large life insurance company, that among 20,000 applicants for life insurance whose parents had both died of cancer, only four had cancer. Out of 492 instances in which one or both parents had died of cancer, 43 per cent. of the other parents had died of some other disease, 56 per cent. were living at the average age of 61, and less than 1 per cent. (four out of 492) had died from cancer.—Arthur Hunter, President, Actuarial Society of America, *Insurance*, Dec. 22, 1916.

SOME STUDIES IN THE TREATMENT OF PYORRHEA ALVEOLARIS *

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In the consideration of the treatment of pyorrhea alveolaris, as with any other disease, we must presuppose a knowledge of the disease. There are, however, so many conditions suggested as being causative factors in pyorrhea, that it is hardly possible to assume that any one of them is responsible for pyorrhea, to the exclusion of the rest. Among the conditions which have been advanced as being causative agents in pyorrhea might be mentioned syphilis, rheumatism, liver affections and autointoxication. These conditions and any other which will lower the resistance of the tissues must be considered as causative factors in pyorrhea, and their eradication, wherever possible, must be accomplished when the treatment of pyorrhea is undertaken.

Pyorrhea should be looked on as an infectious disease and treated as such. Its inception, then, is based on the resistance of the tissues to bacterial invasion, which must be lowered before the infection can be overcome. This means the building up of the resistive forces throughout the entire body, as it is difficult to perceive how the resistance, under these conditions, can be raised in the gum tissues alone. This must be done not only to throw off the present infection but also to guard against its recurrence. The lowered resistance to the tissues surrounding the teeth is due, in many cases, to the well known calcium deposits and irritations produced by faulty dental work. These conditions must be corrected.

If, however, we better understood the causes of pyorrhea and knew more about the tissues most vitally involved in making a repair, we would be able to treat this disease more intelligently, and there would result a greatly increased number of recoveries.

I have been greatly surprised at the wonderful recuperative power of the cementum. The literature relating to this tissue is confined, in the main, to its description and histologic structure, very little being said about its use. Cementum is the bond between the teeth and the bone, the tooth and bone seemingly being unable to form a union themselves. It seems to have about the same recuperative power as bone, and, furthermore, under proper conditions, cementum has the power to regenerate, after it has been cut in grooves or removed entirely from the root, provided a sufficient amount of the cementum is left on the root from which regeneration can take place. If, however, a large portion of the cementum is removed and the remainder then weakened or entirely destroyed by such mild germicides as trichloracetic or sulphuric acid, we should not expect to have any reformation of the cementum. When this is done, we might just as well take the next step at once and extract the tooth as wait and do the same thing at a later date or let nature throw it off herself.

Some time ago I had occasion to make an upper denture for a woman about 50 years old. She had worn full upper and lower dentures for some twenty years. On examining her mouth I noticed an enlarged and inflamed surface in the region of the second bicuspid. She informed me that it had been giving her trouble for a long time and that she had to have a place cut out of the denture to avoid pressure on it. I opened into it and removed about one third of the root of the second bicuspid which had been broken off when the tooth was extracted. The one side was flattened, but there were no sharp edges. A cross-section was made, and when put under the microscope it was found to be completely encased in cementum, the cementum on the flattened surface being nearly a third thicker than the other. A section made near the apex of the root showed a normal condition, with no variation in the thickness of the cementum. When this root was extracted, instead of breaking off at right angles, it split at an angle, and the cementum remaining not only regenerated sufficient tissue to cover that portion of the root that had been stripped of its cementum, but a third more. Dr. Fletcher has recorded a case in which the crown had been broken off in an attempted extraction, and the cementum had not only grown over the dentin but also had partly filled the canal. In this case, too, the cementum which had grown over the dentin was much thicker than normal. These cases seem to show that we may expect a restoration of tissue to a great extent, if not entirely, provided the conditions governing such a growth are ideal. This means that the new cementum forming must not be removed daily or weekly in the overzealous use of scalers and files, nor must the healthy cementum and paradental membrane be removed. To get something, something must be left. The regeneration of the cementum must be the result of stimulation, brought about by the careful use of the affected teeth, and there must be an active blood supply. This can be encouraged by careful but not too diligent massage, and the absence of astringent mouth washes. The teeth must be cleaned, not merely brushed.

The bacteria commonly found in pyorrhea are constantly present in the mouth. If oral hygiene is a common practice with the individual, their numbers are greatly lessened; if not, they become very abundant. A person can go for years with ill fitting crowns and maintain an ideal condition for the development of pyorrhea. That is resistance; and when it is lowered, pyorrhea follows quickly. As long as he maintains that resistance, he is immune; but as soon as it is lowered, pyorrhea overtakes him. In order to recover, that resistance must be returned; otherwise the pyorrhea will only be kept in check, never cured. To prevent the formation of tartar deposits, after they have been removed, Epsom salt is most proficient. It might be said that constipation plays an important part in the formation of these deposits, and should form a sort of index in cases of chronic constipation.

There are a great many pathologic conditions which have or are supposed to have their origin in mouth infections, of which pyorrhea is a common and important one; but it must be remembered that there are lots of people with arthritis who are wearing full upper and lower dentures and have been so doing long before they become afflicted with arthritis. There are a great many cases of arthritis that have their foci in the mouth, but these infections are sometimes present in cases of arthritis, the removal of which does not result in the disappearance of arthritis to any degree. In these cases, therefore, while there may be pyorrhea and other foci of infections present, and while every effort must be made to eradicate them,

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we must not devote all energy to these infections to the exclusion of foci in other parts of the body which may be the chief foci, and relief cannot be had until they are located and removed. Further, there are many roentgenograms which show rarefied areas around the apexes of the roots that are rightly interpreted as being foci of infection, but it must also be remembered that there are lots of others which show the same rarefied areas which are not foci of infection, being localities in which there possibly once was a focus but which has been removed, and the tissue not yet completely filled in, which may never completely take place. This is amply proved by using an aspirator and removing a portion of the content of that supposed focus, only to find it to be nearly free from bacteria. Except in extreme cases, therefore, there is no justification for the extraction of a tooth, simply because a roentgenogram showed a rarefied area, unless substantiated by other diagnosis. The extraction of teeth, in an effort to check infections in other parts of the body, just because a roentgenogram showed a rarefied area, except in extreme cases, is to be condemned. If this practice is to be indulged in, it must have its completion in the extraction of all devitalized teeth whether or not the Roentgen ray shows a rarefied area to be present. Also all teeth that are pyorrheic would have to be extracted because they are foci of infection, and those that are not yet affected would have to be extracted because they might become foci of infection.

THE ETIOLOGY AND TREATMENT OF INTERSTITIAL GINGIVITIS *

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My researches on interstitial gingivitis and pyorrhea alveolaris[1] were published in book form in 1899. In this work every conceivable phase of the disease was studied on animals as well as man. The pathology was beautifully illustrated from its beginning to the formation of abscess, on the one hand, and exfoliation of the teeth, on the other.

The object of this paper is to try to make clear the etiology, pathology and treatment based on the researches laid down in my work.

The tissues about the roots of the tooth may become diseased under extreme local irritation or from constitutional disease, but as a rule the progress of tissue building about the first and second set of teeth prevents tissue degeneration. Not until the bone has obtained its growth, from 27 to 35 years of age, does degeneration take place to any great extent, although marked inflammation of the gums may be present. When the alveolar process has obtained its growth about the second teeth, the bone may be said to have reached the senile stage, and absorption under favorable conditions begins.

THE ETIOLOGY

In considering the etiology of interstitial gingivitis, my researches have shown that the tissues surrounding the roots are end-organs, owing partially to the fact that the teeth, so far as nerves and blood vessels are concerned, are foreign bodies, and partly to the end-structure of the bone. An end-organ is a structure in the body in which nerves and arteries extend to the extreme end and then stop. The veins being extremely sluggish, the blood containing poison remains, and, being unable to return, sets up a low form of inflammation. The dental pulp is the best example of an end-organ in the human body. A study of this structure under the microscope, of persons over 40 years of age, will reveal all the degenerative pathologic conditions possible.[2]

The blood, then, which flows into the alveolar process, owing to local irritation about the gum margin or root of the tooth, does not return into the circulation. Blood charged with metallic, drug or body poisons collects in the alveolar process and produces irritation. Stasis results (Fig. 58, Interstitial Gingivitis[1]), nutrition is cut off, and a low form of inflammation is produced. Nerve end degeneration takes place, endarteritis obliterans, and arteriosclerosis occurs.

Ziegler[3] says:

> The causes of inflammation may lie either in mechanical, thermal, electrical or chemical influences, as well as in the influence of parasites. The common characteristic of all these injurious agencies is the production, in the first place, of a local tissue degeneration, which, when of a certain extent and intensity, is associated with disturbances of the circulation and of vascular secretion.

This exactly describes the condition found in the alveolar process. Stasis of blood in interstitial gingivitis is, then, due to mechanical irritation and possibly chemical changes in the blood.

Ziegler[3] again says:

> Under the designation inflammation are grouped those pathological processes, consisting on the one hand of tissue degenerations and tissue proliferations, and on the other, pathological exudations from the blood vessels.

In this particular form of inflammation, tissue degeneration takes place. There is no pain, heat or swelling as observed in the other forms of inflammation.

When we consider the peculiar endotransitory nature of the alveolar process, degeneration of tissue is the natural result. At the senile period when the excretory organs are diminishing in activity and in disease, vital resistance is at its lowest ebb, metabolism is diminished, and degeneration and absorption of the alveolar process is in active operation. As age advances, the destruction of bone is a natural normal pathologic process.

The disturbances in circulation bring about tissue degeneration because the gingival border of bone is very thin, transitory and easily destroyed. The action of this mechanical irritation is to produce artery changes, nerve end degeneration and absorption of bone about the arteries, called halisteresis. Stasis of blood may take place in a circumscribed area, or on the entire border of the alveolar process; or the apical end of one or more roots may be involved. This depends on the nature and quality of the irritant. The nature and severity of the irritation, stasis of blood and a lowered vitality of the patients will also determine the extent of the destruction of tissue, whether the irritation is located at the apical end of

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* Read before the Section on Stomatology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Talbot, E. S.: Interstitial Gingivitis or So-Called Pyorrhea Alveolaris, Philadelphia, S. S. White Dental Manufacturing Company, 1899.

2. Talbot, E. S.: Developmental Pathology, Boston, Richard G. Badger, 1912, chapter on the dental pulp.

3. Ziegler: General Pathology, p. 314.

the root, midway between the apex and the cervical margin, or at the cervical margin.

When the inflammation has once become established at the cervical margin, the absorption is progressive to a greater or less extent until the tooth or teeth are removed. Owing to the transitory nature of the alveolar process when irritation and stasis of blood occur, the nutrition of the part is interfered with and the bone tissue may be partially or wholly destroyed, leaving the fibrous tissue (trabeculae) undisturbed, thus holding the tooth firmly in position, although it can be moved laterally by the fingers. In most cases, however, the entire structure, including the fibrous tissue, is destroyed.

My researches have shown that the deposits on the roots of the tooth, other than tartar, are the detritus of destroyed bone and not deposits from the blood, as was formerly supposed. The pus stage is an after-consideration, and has nothing to do with the disease.

In summing up the etiology, then, in this disease: 1. We have to contend with the bone as an end-organ in which the blood accumulates (stasis). 2. Stasis of blood cuts off nutrition. 3. Local and constitutional irritation and chemical changes in the blood set up a low form of inflammation and bone absorption. 4. The absorption is enhanced because of the transitory nature of the alveolar process. 5. Nerve end degeneration and arteriosclerosis occur. 6. Want of vital resistance assists absorption.

LOCAL TREATMENT

The first symptom of interstitial gingivitis is bleeding of the gums on the slightest injury. The classification of the different phases of the disease renders the treatment, so far as we are capable of directing it, simple and easy.

The first thing that naturally comes to the mind of the operator is to remove the cause. The local treatment may begin immediately. For personal reasons of cleanliness of the patient and the operator, one or two applications of iodin should first be made to the gums, which will destroy the germs and cleanse the mouth. After this has been accomplished, the removal of all local irritation may begin.

We have seen that stasis of blood cuts off nutrition, causing degeneration of tissue (absorption of bone). *The main object to be obtained in the treatment of this disease is to remove the stagnant blood, reestablish the metabolic process and cause a normal flow of fresh blood to nourish the parts.* The nutrition of the part must be renewed that Nature may restore the tissues to health.

How shall this be accomplished? To remove congested blood, physicians, from fifty to a hundred years ago, resorted to cupping, leeches and scarifying the tissues. These methods must be resorted to at the present time in treating this disease. If the gums are congested and festoons hang down between the crowns of the teeth, they may be removed on a line with the alveolar border with a lance.

The gums should be allowed to bleed as freely as possible. In removing the deposits from the roots of the teeth, the parts may be injured as much as possible with as little pain to the patient as possible, the germs having first been destroyed. In this way much of the congested blood can be removed.

The suction process, not unlike the old method of cupping, is excellent when properly performed.

Scarifying the gums is also a good method of procedure. Vigorous gum massage with a stiff gum massage brush should now be employed to stimulate the tissues to healthy action.

Before the operation and after bleeding, iodin should frequently be employed to destroy all germs in the mouth. All loose teeth should be removed.

The following preparation has been used since 1878:

Water	10 parts or grams.
Zinc iodid	15 parts or grams.
Iodin	25 parts or grams.
Glycerin	10 parts or grams.

The iodin destroys all germs in the mouth and cleanses the tissues. The zinc iodid is used to contract the tissues, the glycerin to assist absorption. This preparation is applied to the gums, teeth and mucous membrane by a long, slender applicator with cotton wound about the end. It should be applied as often as every other day if possible. It is not to be used by the patient.

Friction and stimulating methods must be employed by the vigorous use of a "gum massage brush." The brush should be so shaped that it will reach the festoons between all the teeth.

It should be made of the stiffest unbleached bristles that can be obtained. The brush should be inserted into the mouth, the mouth and teeth closed. In performing this operation the mind should be concentrated on the gums and not the teeth. When the tissues have become revitalized, deposits from the alveolar process on the roots of the teeth will cease to form.

One of the best gum washes for the patient to use in connection with "gum massage" is that of the zinc sulphocarbolate recommended by Dr. W. H. Whitslar of Cleveland. This drug may be used in different strengths and in many forms. The following is a combination which I use:

GUM WASH

Zinc sulphocarbolate	60 grains
Alcohol	1 ounce
Distilled water	2 ounces
True oil of wintergreen	8 drops

The patient should use this gum wash and massage the gums three times a day. The patient should be under the care of the operator at least two or three times a week, so that he may direct the treatment. The treatment of interstitial gingivitis at the apical end of the roots must be carried out according to symptoms.

CONSTITUTIONAL TREATMENT

While the local treatment is being conducted, the patient's general health should be inquired into. A twenty-four hour sample of urine should be obtained, and a thorough laboratory examination made. If there are casts and high acidity, and indican is abundant, meat should be excluded, the patient placed on a vegetable diet, and the acidity reduced. The bowels should be kept open and large quantities of water consumed. There are many methods of cleaning the system and bowels. The following may be used to good effect; a teaspoonful in half a glass of warm water every four hours:

Calcined magnesia (heavy)	½ ounce
Sodium bicarbonate	1½ ounces

If the patient has sugar, albumin or other complications, it is best to refer the patient to a physician for general treatment.

By this method of treatment the patient, in the estimation of the average dentist, is cured, not, however,

as other diseases of the body are cured. Eternal vigilance is necessary on the part of both operator and patient to prevent blood from again collecting in the blood vessels of the alveolar process, and a return of the disease.

The bone is still an endotransitory structure, and having once become diseased, it is much easier for the stasis of blood again to take place. As the patient advances in years, the excretory organs become senile, poisons collect in the blood, resistance is lowered, and there is a gradual absorption of bone taking place about the teeth throughout life.

31 North State Street.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. LESCOHIER, POTTER, RHEIN, HARRIS AND TALBOT

DR. ARTHUR D. BLACK, Chicago: The first most outstanding feature of the pathology of this group of diseases is their chronicity and this has possibly contributed much to the difficulty of a clear understanding of the pathology. This condition, which I will term a chronic suppurative pericementitis, will, in the average case, be progressive extending over ten, fifteen or even thirty years. In those cases where we have a systemic cause as the principal one, we would naturally expect to find a general involvement of the peridental tissues. Except for some added local exciting cause, there is no reason why one or a few teeth should be picked out; all of the teeth should be included in the manifestation of the disease where the systemic condition is the principal cause. On the other hand, in those cases where a limited number of teeth are involved, we would naturally expect to find that the local exciting causes had played the primary rôle. As to the bacteriology, many men have endeavored to find a specific organism which could be associated with this disease, and they have failed. One fact argues against a specific organism as being the cause, and that is the progress in these pockets, and this progress is very much more rapid toward the apexes than laterally around the roots. We observe many cases in which from an original pocket there have developed a number of other surface pockets, without any involvement of contiguous surfaces of the teeth. The tendency is for a tooth to move away from the side of the pocket, because encircling each tooth are the fibers of the peridental membrane. These are on a tension, and when the tissue is destroyed on one side of the root the balance of those fibers is lost, and the fibers of the opposite side draw the tooth in that direction, unless some obstruction of occlusion prevents this. There never is a detachment of the peridental membrane alongside the root that is not preceded by a gingivitis. In the destruction of the tissues about the root one of the earliest manifestations of the presence of a pocket alongside the root is a stripping off of these tissues from the cementum. As time passes there is left a connective tissue which has nothing which may differentiate it from a general connective tissue. Those elements which are necessary to a normal reattachment of tissue to the tooth are lost. What else has happened? The cementum has absorbed the products of that suppurative process. It has been changed from a positively chemotactic tissue into a negatively chemotactic tissue, which will repel tissue attachment.

As to rebuilding of the cementum: I have examined many cases and seen many in which there has been an absorption, not only of the cementum, but of a considerable portion of the dentin of the tooth, but I have never seen any in which there was a detachment in that area. They were not infected cases; there had been no suppuration. They were not cases in which, if you leave the end of a root, you will find cementum building over it. Dentin has no power of rebuilding cementum. Some one said it was closely comparable to bone. It is, except that it has no circulation. Its life depends on the cementoblasts on its surface. No changes take place within it. As the pocket progresses farther down the side of the root, we must expect the first absorption of the alveolar process to take place near the crest, and then as it continues around the root, in cases of long standing we have a funnel formation in the bone. That is one of the marked symptoms of progress of this disease. I would like to criticize Dr. Potter's use of the term erosion in connection with these destructions or absorptions of the bone. It seems to me that the term rarefication is hardly applicable to these cases, because the bone is either destroyed or absorbed. Dr. Potter spoke of looseness and tightness of some of these teeth. Many times we have a very loose tooth, so far as motion is concerned, and yet it is difficult to extract. As a result of inflammation, the fibers of the peridental membrane which remain attached to that tooth have lost their tonicity; they are not taut, and are apparently lengthened considerably, so that the tooth has an excessive motion, which does not at all compare with the amount of destruction of tissue which has occurred. Treatment will tone up those fibers and they will again exert their normal pull.

DR. FLOYD D. LEACH, Chicago: There is a certain amount of tooth movement laterally, that is, from buccal to lingual. Dr. Black said something about a peculiar action of the microorganisms which caused a destruction of the investing tissues of the teeth, especially along the proximal surfaces of the roots. We have all seen this condition, causing the breaking down of the contents, due to the lateral motion in the act of mastication. It is not easy to guess or feel quite sure that those fibers of the peridental membrane which die to the buccal, labial and lingual sides of the socket should take the mechanical strain. I have an idea this condition may be the reason why the progress of the destruction is more pronounced on the proximal surfaces of the roots than on the buccal, labial and lingual. You have always noticed that the pockets are really on the interproximal surfaces. The gum would recede from the lingual, labial and buccal surfaces of the roots, and still in a great many cases be very firm as to attachment. Food substances constantly massaging these areas, and the friction of the brush when a brush is used in cleansing the gums and teeth stimulate to a greater extent those areas on the buccal, labial and lingual surfaces. But I think the mechanical arrangement of the fibers adds more resistance, more tone and more strength to these buccal, labial and lingual vestiges.

DR. RUSSELL W. BUNTING, Ann Arbor, Mich.: We have been told by some that pyorrhea is the result largely of constitutional factors, and by others that pyorrhea is the result of local disturbance, such as infection and irritation. Almost all have agreed that very frequently there are combinations of these two. May I present this view of the situation? May we say that pyorrhea is caused by an exciting condition, such as the infection which destroys the tissues about the teeth and severs their attachment? But infection is not the determining cause? The determining factors are all the predisposing causes, either local or general, which make the characteristic action of the exciting causes possible. I like Dr. Rhein's statement that healthy tissues cannot be infected. How often have we seen ten times the local infection that would be necessary to produce pyorrhea existing in the mouth, and no pyorrhea present? Why? Because those tissues were so healthy that they were not infected, even under very untoward local conditions. If this is true, we must recognize not only the local but the general conditions as causative factors. As Dr. Rhein said, our constitutional factors are often so obscure that the ablest and most careful internist cannot detect where they are located, or what their nature is. The infective condition alone which is present in the mouth could not have produced the pyorrhea in such cases but for that remote constitutional condition which made it possible for this to happen. Fortunately, we find that very frequently the clearing up of the local causes allows the tissues to come back to an apparent normality.

Can we cure pyorrhea? I have taken the stand that we cannot cure pyorrhea unless we can obliterate the pockets. Dr. Harris said that the pocket may be obliterated because cementum is built on the denuded surface, and that new attachment is had to the tooth. Dr. Black does not believe that pyorrheic teeth can ever have a reattachment. We must admit that if pyorrhea is to be cured absolutely, either the soft tissues must be reattached to the tooth completely

up to the free line of the gum or else the gum line must be retracted down to the place on the root at which it is attached. If it is true that these tissues can never be reattached, why should we not treat pyorrhea by opening the pockets, cutting away all overlying tissue, clear down to the bottom of the pockets, exposing the healthy tissue and allow it to heal? We would then have obliterated the pocket and the pyorrhea. But is that the only way in which it may be done? It is my conviction that the tissues may be made to physically join to the surface of the root after they have been denuded from it in the formation of a pyorrhea pocket, if the conditions are right. I have had many specific instances of pockets, in which I could get one quarter, one half or three quarters of the length of the root with an explorer, or any other instrument, and at the conclusion of a month or two of surgical treatment, assisting the tissues to return to as near the normal as possible, I have been unable to get the finest instrument between those soft tissues and the root of the tooth in the identical place where the pockets had existed previously. What has taken place in those pockets? Are there any other two tissues in the body that would so approximate and still not be physically attached? I do not think so. Let us take a surface view of that pocket. Pyorrhea seldom goes down circumferentially, attacking the tissues equally. It rather goes down one surface. If we prepare this root surgically and make it clean, we have remaining on either side living, healthy pericementum, which is capable of reproduction and filling in the space with new tissue. This is laid down first in the form of granulation tissue from which tissues may develop having the propensity to form a bony-like material, or even true bone, which may be deposited on the surface of the root, and attach those primitive fibers, or embryonic type of transitional tissue, to the surface of that root. When a root is resorbed there is in many cases entire breaking up of the fibers. The bone is entirely taken out at a given area and only a transitory type of tissue remains. Dr. Black said that in one case the destruction was not infective and that in the other it was. But was it not destroyed in both cases and what is the difference? There are cases on record in the literature in which a bone has been cut across; a section has been taken out, and in the gap there has been placed an ivory bit that reproduced as nearly as possible the bone which was removed. Later that section has been removed and has been examined in microscopic section. It was found that the ivory had about it a layer of new bone which was quite like a lamellar bone placed on the outside of the ivory. Outside of the bony layer a soft tissue formed, quite like periosteum. These tissues had adapted themselves to form a direct attachment of soft tissue by a bone forming process to the ivory, in which there was no circulation, without which Dr. Black stated reattachment could not occur. We are told that exactly the same thing has been done with platinum in which bone has been laid on top of platinum, and the soft tissues glued to the platinum in the same manner.

DR. EUGENE S. TALBOT, Chicago: I conceive an entirely different condition of things than has been explained to you by Dr. Black and Dr. Bunting in regard to pockets. There is no question about the pathology. It is all laid down in my work, and has been verified in a great many different methods of experimentation. My own researches explain that many of the statements, made by Dr. Black and Dr. Bunting, are much more simple than the points brought out by them. For instance, arteries run through the alveolar process and the peridental membrane. When irritation takes place, whether local or constitutional, the artery is filled with irritation. If constitutional, it may be poison; if local, it may be anything that produces a local irritation. If you will examine the illustrations in my book, you will find that the bone extends around the artery. The irritation, then, is set up in and around the artery, and if there are a dozen arteries there are a dozen points of irritation, inflammation and absorption, and the absorption starts out from the artery. We will say that this irritation is due to lead or mercurial poison. That material is carried down into the artery, and it may extend clear to the end of the root. What has taken place? Absorption has taken place around that artery, and only one artery is involved. Absorption has gone down to the end of the root. But if the irritation is greater, either constitutional or local, these arteries passing in a lateral direction, as well as those passing longitudinally, may absorb the entire process on the one side of the tooth, while absorption has taken place downward in the other case clear to the end of the root in one or two arteries. To explain Dr. Bunting's point about filling up of the alveolar process with new material if the inflammation has extended down the side of the root, with one, two or three arteries involved, the bone is liable to heal up if the cause is removed. If, on the other hand, the bone has been entirely destroyed downward and pockets have been formed, that bone is never restored, because the fibrous tissue is entirely lost. Bone absorption takes place by halisteresis before the fibers of the peridental membrane are destroyed—just the reverse of Dr. Black's idea.

DR. MEYER L. RHEIN, New York: Not a thing has been said in regard to cemental repair that can be denied under certain conditions, and yet we have listened to statements that appear to be absolutely in opposition to each other. I know that Dr. Bunting is correct in what he has said. I know that exposed cementum can be repaired and the normal condition replaced, but each of the speakers has omitted to state in what conditions repair, or lack of repair, takes place. Dr. Talbot gave a very lucid description of what takes place in the tissue when arteriosclerotic conditions manifest themselves. We get these conditions in certain forms approaching the period of senility, in certain forms of malnutrition, nephritic and diabetic conditions, and under such conditions that repair of the kind that Dr. Bunting spoke of is impossible. Why does a pocket form? We get a pocket on account of imperfect nutrition to that particular spot, and as a consequence there is the impossibility of repair which must ordinarily take place throughout the body daily. The same conditions that produce pyorrheal conditions are at work in erosion, where there is found a continuing loss of gum tissue, exposing the root surface, except that the local resistance, due to many causes, has prevented infection from taking place. In other words, in the retraction of the gum which results in the exposure of considerable of the root surface of the teeth, we meet with the same lack of nutrition that is demanded at every ultimate point of nutritional circulation. Pyorrhea may occur in people suffering from fatty degeneration about the heart. What are the appearances of the mouth in this condition? There is no suppuration. There is no deposit on the roots, but very extensive pockets that frequently go down deep, and we find the gum in ribbons over these pockets. They are great big flabby pockets, with a deterioration in color and character of the circulation. I have never seen one with any purulent condition. I have seen those gums come back absolutely to what we would consider comparatively healthy gum tissue under the Nauheim treatment. If the malnutritional factor has disappeared after treatment, you may call that patient cured. What is the reason that exposed cementum, considering that there is no condition of malnutrition present, will not permit the tissues to recover? It is due to the fact of exposure of this cemental surface to the irritating fluids that are in circulation. I believe it will take exceptional conditions to permit a cemental surface that has suffered abrasion to repair, because of the danger of retrograde metamorphosis going on from its exposure to the fluids of the mouth, consequently the therapy must be of such a mechanical nature to cover that cementum that it will not be exposed to the fluids of the mouth. I have done this for many years by coating the surface of such cementum with chloropercha, keeping the exposed cementum hermetically sealed and thus protecting it from the fluids of the mouth.

DR. GEORGE B. HARRIS, Detroit: I have been misunderstood a little in regard to the regeneration of cementum. In the first place, I do not wish to be understood as saying a complete regeneration takes place. The point I wanted to bring out is that there are cases in which the cementum has regenerated, and these cases were not under aseptic conditions. Can anybody imagine the crown of a tooth cut off below the gingival margins or split half the length of the root with the cementum forming over it, and say that this portion was in an aseptic condition? I do not believe it. Further,

where the cementum is diseased we can remove it, leaving nothing but the healthy cementum below, producing a condition that is as near aseptic as it is possible to get under the conditions, a condition at least equal to those mentioned where the cementum did reform. It is possible, then, that the cementum will reform there. Whether it ever has or not, I do not know, because there is no way of measuring it as it takes place in the mouth, unless you would happen to find a tooth where the difference in density of the cementum will show, or where it would be shown by the new cementum making a thicker coating.

DR. G. H. SMITH, Medina, O.: This subject of pyorrhea has been of intense interest to me for five years, and I would like to suggest to the medical profession that they advise more of their patients to select an ethical dentist. Dr. Moorehead made a statement in his address that I can hardly substantiate. He claims that only 10 per cent. of the dentists were efficient. There are dentists commercializing, but with the cooperation and advice of the medical profession many patients would escape many dental disorders.

DR. WILLIAM C. FISHER, New York: I want to ask Dr. Rhein if I understood him to say that in a diabetic patient he would not consider operative procedure as being wise, or that it had been known to even be fatal?

DR. RHEIN: Correct. I said diabetes not under control.

DR. FISHER: I am not thoroughly convinced that a dental operation is precluded in any patient—diabetic or otherwise—who is able to visit your office and go about his business. I believe, of course, in the medical treatment, but I certainly think that there is absolutely no shock, such as that experienced in a major operation while treating these patients. In pyorrhea I use the several solutions of iodin. Dr. Talbot spoke of gum massage with the brush. Do you mean the hand or engine brush?

DR. TALBOT: The hand brush.

DR. FISHER: I was afraid that possibly you meant the engine brush. In polishing teeth we want to get away from anything that will in any manner injure or tear the tissues, and I have devised a simple little mandril of one piece of steel. I use French tubing of different sizes to fit; and make my polishing powder, mixing in with that iodin. As this mandril revolves in the engine, the French tubing will flare out on the surface and coax up the gum, whether receded or not, and polish the surface beneath the gingiva. In the interproximal spaces select a smaller piece of tubing, and it is possible to get a polished surface there. With that method you get a massaging of the gum which the patient cannot possibly give it. You are massaging the gum at the same time that you are polishing the neck of the tooth where it has been scaled.

DR. W. A. PRICE, Cleveland: Two decades find us almost exactly where we were when I started to practice dentistry twenty-three years ago. We cannot come together and express a common idea relative to the etiology of pyorrhea and be united in supporting and substantiating it. We have made practically no study whatever of protein absorption, which takes place around these pyorrheal infections. A large number of nervous lesions of the body have apparently been traced directly to dental infections and to pyorrhea. The medical profession must bring these patients back to us for treatment, and we cannot even give the A, B, C of the infection in pyorrhea. We do not know the nature or the morphology of 50 per cent. of the bacteria that grow in pyorrhea pockets. They have not been grown artificially. What is the solution? If I were to ask Dr. Talbot how he got his information that has been the great cornerstone for a large part of this work he would say, "Hours and hours, and days and days, and years and years of hard work." How many men are devoting a worthy effort to this work? We are called on to redouble our efforts to answer with some degree of intelligence this great question of the etiology of pyorrhea, which today we know almost nothing about.

DR. HOLLIS E. POTTER, Chicago: I can see now that the pockets we are showing with the Roentgen rays represent more absorption of bone than any such slight detachment as you have been talking about. I should think that in cases where we are showing Roentgen ray findings of absorption around a tooth, when we are talking about a pocket, it is a very gross condition as compared with the small and limited pockets that the controversy is about this afternoon.

DR. ALEXANDER W. LESCHIER, Detroit: As Dr. Price said, it is possible that there are many good things we do not know about the bacteriology of pyorrhea, but there is one fact which I do believe has been established, namely, the preponderance of streptococcic infection. I do not mean to imply that the streptococcus is the cause of pyorrhea, bacterial infection being apparently a secondary element, characteristic of the pustular stage and not of the initial condition. But, in view of its potential virulence and the persistency with which the streptococcus is found, it is indicated that certain strains have a peculiar affinity for the peridental tissues. Also that as far as the sequelae of pyorrheal infection are concerned, particularly the arthritic, the streptococcus overshadows in importance other micro-organisms.

DR. H. A. POTTS, Chicago: May I ask if it has been determined whether or not this streptococcus which he finds in pyorrhea is an aerobic or an anaerobic one; whether hemolytic or the *Streptococcus viridans*, and what connection there is between the effects of these streptococci of pyorrheal infection and those found in chronic abscess?

DR. LESCOHIER: I cannot answer definitely the questions raised. The work of Hartzell and others has indicated that the *Streptococcus viridans* is found much more frequently than any other type, but hemolytic streptococci are also observed in some cases. I would not undertake to answer the question as to the relationship between streptococci elsewhere and those in pyorrhea and alveolar abscess.

DR. MEYER L. RHEIN, New York: I do not want to let the inference go that I am oblivious to the fact that it is necessary to have an attacking organism when we come to this stage of infection. There seems to be a strong elective affinity of certain micro-organisms to attack the gingival tissue dependent on certain malnutritional predisposing causes. There is a type of pyorrhea due to certain kinds of malnutritional causes where the attacking organism is a protozoon. I have cured three distinct cases of pyorrhea in the last two years with emetin, and I failed in numerous other cases. Now, why should this be? It simply carries out in the ultimate analysis what Dr. Lescohier's paper has shown us, that there is no one specific organism in pyorrhea. The three patients I cured all seemed to have the same kind of malnutritional predisposing causes; they were all cases of intense inflammation and infective conditions in the larger colon. They were cases that had shown symptoms that very closely resembled epidemic forms of dysentery. Now, is it illogical, is it surprising, that in a condition of that kind, where we know the endameba plays the rôle of attacking force, that when by reason of this predisposing cause the mouth shows the evidence of pyorrhea we should find the same organism again the attacking force? The place to find pyorrhea is not among the patients who come to the office of the dentist. You will find pyorrhea almost everywhere. About 85 per cent. of the cases that the average dentist treats as pyorrhea are nothing more than some focal infection that has been diagnosed improperly and in which a roentgenogram would demonstrate the error of the diagnosis. In chronic alveolar abscess, with its sinus opening out into the mouth, sooner or later symptoms appear that approach and grossly deceive the careless diagnostician, and there is no reason why you cannot get an alveolar abscess with a pyorrhea complication, if you want to call it such, that is dependent entirely on the apical infection. I have found such a condition in a considerable number of cases. On careful differential diagnosis I could put my hands on the point of focal infection. That is especially true in cases where there seem to be one or two teeth only subject to pyorrhea. When an individual comes with a pyorrhea in one or two teeth, the diagnosis is open to grave suspicion. I have found the focal infection of a pyorrhea showing in an upper incisor, away back in the roots of a second molar, and I recall quite well the difficulty of making a diagnosis in that particular case. I was a little surprised at Dr. Fisher's question as though I was in doubt as to whether operative interference was to be avoided in diabetics where the diabetes was not under control. It is not a question of a major operation that makes a surgical condition a most dangerous proposition under

such conditions. I know of no surgeon who would not seriously hesitate to do the most minor surgical operation on a patient showing a large percentage of sugar. It is true that under certain conditions, when it becomes a question of life or death, the surgeon will take chances. He knows the patient is going to die from septic causes, and he is going to give that patient the benefit of that chance. The deaths from teeth extraction in diabetics would fill a very large chapter if they could be brought together.

DR. FISHER: Does that mean from the anesthetic?

DR. RHEIN: No. I am simply stating what is an abstract fact that is settled in the minds of surgeons, pathologists and bacteriologists at the present time. In regard to research work: We have had to have recourse to animal experimentation to a large extent, and I am convinced that all the dental research work on animals in the past is replete with error, because the mouth flora of the dog is so different from the mouth flora of the human that it cannot consistently be taken as the same in any experimental work on animals. This is a very important factor, and it is far better for dental research work to proceed slowly and get results that are not going to be questioned in the future than to make comparisons and arrive at conclusions that cannot be verified.

DR. EUGENE S. TALBOT, Chicago: If you will examine the dental journals, and some of the medical journals, you will find that a large percentage of the pictures that have been shown are represented as abscesses. Dr. Potter has shown us that there are a great many different shades or conditions of the alveolar process which are not abscesses, and the reason for that is that we have a condition of absorption called halisteresis, and not lacunar absorption in the alveolar process, which may be or is due to the irritation that has taken place from the pulp chamber. The degree of absorption will depend on the amount of irritation. In regard to focal infection, the dental profession can hardly be blamed for abscesses at the roots of the teeth after the canals have been treated and filled. Up to within the last two or three years, when an abscess formed on the root of a tooth and the face swelled or a fistula had formed, the only means of knowing that the abscess was supposed to be cured was that the face became reduced to a normal state and remained so; the fistula healed and did not return. These were the only symptoms available when the tooth remained quiet without pain or swelling which led the operator to believe that the abscess was cured. With the modern methods of diagnosis, the Roentgen ray, we have learned that these signs are not for a moment to be considered. The Roentgen ray demonstrates that very few abscesses are destroyed and healed, but that they remain cold or blind abscesses, discharging pus into the tissues for an indefinite length of time. I recall one instance in which an abscess remained on the root of a left superior first molar for fifty-two years.

Characteristics of the Chinese.—It seems that the Chinese typically has a higher threshold of stimulation than the occidental. It takes a larger summation of stimuli or a greater single stimulus in the first place to rise into consciousness, and in the second place to cause reflex activity. So we see him impervious to noises, odors and sights which western nerves bear but poorly. We see him existing with no complaint and no idea of betterment, in squalor, misery and poverty which western personality would find at once unendurable. We see him exercise a fatalistic indifference to the immediate or remote future, because no clear picture has arisen in his consciousness of any condition or time different from his own immediate present. When the summation or single stimulus is sufficiently great, however, for sensation to appear in consciousness, there is but a narrow margin of normal response before the reaction becomes pathological. Hence it is that all the psychoses and neuroses are so easily aroused, since the zone of normal response is narrowed by the high threshold of stimulation. Thus we see the superficial anomaly of sluggishness, inertia and indifference associated with a high and poorly controlled emotional nature which involves and easily goes over into hysteria and various emotional crises.—Dr. Alfred C. Reed, *Scientific Monthly*, January, 1917.

AN ANALYSIS OF FIFTY CASES OF SCIATICA *

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The purpose of analyzing a series of cases of sciatica and presenting it before this section is to discuss whether there is such a condition or clinical entity that is called essential or idiopathic sciatica. Also I wish to discuss in relation to teaching, what should be taught, and in what department of the medical school should it be made the subject of teaching. There is no question but that it is firmly fixed in the layman's mind that sciatica is a disease in itself, a distinct entity, and I am sure that the profession at large also is satisfied that it is an entity, although realizing that at times it may be a symptom of a lesion elsewhere. If we appreciate that there is a definite cause in every case and that cause can be demonstrated as a physical fact, then much of the uncertainty will be changed and the treatment will become more rational and exact.

What is the necessity for discussing this subject? That it is an indefinite and undecided condition is very well shown by any textbook on internal medicine or nervous diseases. Either what the orthopedist believes to be true, and I suppose my experience as brought out in these fifty cases will correspond with yours, is entirely wrong, or else the various authorities on which we have to depend are giving a wrong conception of this condition.

Let me quote from one of the authorities as to treatment:

> Certain remedies are of service in sciatica. Prolonged baths give excellent results. The patient must remain in his bath for several hours. Antipyrin may be prescribed in doses of from 15 to 45 grains. Injections of morphin and inunction of an ointment of methyl salicylate may give relief. Blister, the actual cautery, injections of sterilized water, injections of air, and epidural injections by the sacrococcygeal route have their indications. Bleeding leeches and cuppings are useful.

I am familiar with the teaching of two medical schools and as far as I know sciatica is not definitely taught as a part of the curriculum in either one. I received no instruction as a student and supposed that it was a pure nerve lesion. I rather believe that it is not considered of very great importance, and therefore falls between the departments of medicine, neurology and orthopedics. Therefore we had to gather our knowledge from the textbooks and current literature, and enough has been said to show the confusion that exists, and this is the reason for presenting these facts.

It may be argued that this is a rather selected group of cases, because I would be more likely to see cases with joint symptoms. There is a certain element of truth to such a statement, but many of these cases had been definitely treated for sciatica by other men, with the idea that there was an inflammatory lesion of the nerve trunk. I am sure that this series of cases represents what is commonly called sciatica. Fifteen years ago there were reported from the nerve department of the Massachusetts General Hospital of Boston a large number of cases of sciatica, as shown in the annual report. The other day I went over the records of this same department for the last six months and found

* Read before the Section on Orthopedic Surgery at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

three cases that were diagnosed sciatica. One of the staff of that department analyzed these three records, and he could find no evidence of an essential sciatica. In other words, they have no record of such a condition in the last six months.

I was interested in discussing this question of essential sciatica with one of the older orthopedic men, and he said that most sciaticas were certainly due to joint lesion, but he supposed there must be real sciaticas. But the point is that he never has seen one. Several medical men of good standing have informed me that they have never recognized a case of so-called idiopathic sciatica. Now, where certain groups of men recognize sciatica as a distinct disease, a perineuritis of the sciatic nerve, and that is the commonly accepted pathology, and another group are not sure that there is such a condition, it means either that our older teaching and the larger part of what the textbooks teach are wrong, or that I have not seen the type of cases that they describe. I believe such a fact as here presented in regard to the records of the nerve department of the Massachusetts General Hospital show that we are all dealing with the same type of case, but from a different point of view.

As the analysis of this series will show that the lesion is located at the origin of the sciatic nerve, and not along the course of the nerve as is commonly taught, and as it is the contention that the most common cause is a joint lesion with a secondary effect on the nerve which is anatomically in close apposition to the joints which make up the lower part of the spine, it will be necessary first to consider the various points in the physical examination of any case of sciatica which indicate a joint lesion.

To study the physical examination of such a well-known condition as sciatica would seem to be unnecessary, but certain features seem to me to be overemphasized and are always explained on the basis of a nerve lesion. It is quite easy to demonstrate that an acute attack of sciatica has a definite joint basis, but it is more difficult to explain the cases that show a milder degree of pain and that are more chronic in character, because the symptoms referable to a joint are less marked than the resulting nerve pain.

The evidences of a lesion of any joint, whether due to disease or to trauma, is definite and clear cut. They are pain referred to a joint, tenderness to touch, limitation of motion, deformity resulting from muscular spasm or from a permanent lesion, and changes in the joint as shown by the Roentgen-ray.

It is very common in sciatica to have the pain referred to the lower portion of the spine, starting from that region and extending down the course of the nerve. Often the patient will put one finger directly over the sacro-iliac joint or the lumbosacral joint and locate the pain definitely at the joint.

In the acute cases, those that are due to an acute joint trouble, there may be definite tenderness to touch over one of the articulations, and sometimes this may cause pain down the sciatic nerve. Of course, it is impossible to cause direct pressure on the nerve by pressing on the posterior surface of the joint, so the effect must be through a sensitive joint and thus to the nerve which lies anterior to the joint.

Limitation of motion of a joint does not need any explanation as an indication of a joint lesion, except to explain how it is detected in lesions about the lower portion of the spine. It may be observed while the patient is standing, and then it will be noticed that forward, lateral or backward bending will either be definitely restricted or will cause pain. A more delicate test is to have the patient, while lying on the back and with the knee held straight, flex the leg on the abdomen. This is the Kernig test and has always been explained as causing pain because it stretched the sciatic nerve. It seems to me that the true explanation is that there is a direct leverage applied to the sacro-iliac joint, because with the leg held straight, the ham-string muscles running from the ischium to the head of the tibia pull directly on the joint. I have never been able to convince myself that anatomically the nerve is stretched by this procedure, and I believe it to be a fallacy handed down from one book to another. In the severe cases it often is not possible to raise the leg in this position 6 inches from the table and this cannot actually stretch the nerve, while it will pull on a sensitive joint. With the patient lying face downward, hyperextension of the thigh, which pulls on the sacro-iliac joint in the opposite direction, will often cause sciatic pain, and this certainly cannot pull on the nerve.

These two tests, this so-called straight leg raising and the hyperextension of the thighs, are the two most delicate tests that affect the motions of the sacro-iliac joint. It has long been recognized that in cases of sciatica Kernig's test is very apt to be positive, but the interpretation has always been referred to the effect on the nerve and very little mention has been made of its action in causing motion of any joint.

One of the chief symptoms of a lesion about a joint is deformity which arises whenever the lesion is of any intensity. In the knee-joint the deformity is flexion and in the hip-joint it is flexion and adduction, as a rule. So that when we see deformity we naturally look for a joint lesion. In sciatica it is very common to notice a change from the normal position of the lower portion of the spine. This listing or deviation from the normal position is due to either muscular spasm or joint spasm, in the acute cases, or to permanent changes in the joint, in the more chronic cases. It is simply what happens in the course of any joint trouble and is commonly seen in the more severe or acute cases. If the listing persists we have what is commonly called sciatic scoliosis, that is, simply a deviation or a deformity of the spine due to some joint lesion.

Much has been written, especially in the German language, about sciatic scoliosis, but it seems to me that it is simply a symptom and not a distinct condition by itself. For the purposes of this paper I shall not go farther into this symptom, but simply draw attention to the fact that it is indicative of joint lesion.

The Roentgen-ray should be used in the examination of many cases of sciatica, the same as would be done in any joint case, to show whether there is any bone lesion that is the cause of the symptoms. Tuberculosis of the fifth lumbar vertebra is often treated for sciatica for months, because we are content to consider the latter as a disease. Hypertrophic arthritis, or osteoarthritis of the spine, often has sciatic pain as its chief symptom. Also a careful Roentgen-ray study may show why the joints of the lower spine are subject to chronic strains, because we find that the fifth lumbar vertebra is very apt to show certain changes from the normal, such as extra long transverse processes.

It is not the purpose of this paper to deal with any minute point in the etiology, or to go into detail in regard to any case, but I shall try to show in the analysis of these cases that a joint in the physical examination shows a lesion and the treatment is based on this fact. Also I shall not discuss whether in any individual case there may be a dislocation or subluxation of the sacro-iliac joint, which has lately been under discussion, but shall call those cases in which this diagnosis might be possible acute joint strain, a term which is broad enough to cover the subject. Nor shall I try to differentiate whether the lesion may be of the sacro-iliac joint or of the lower lumbar joints, because a disturbance of any of these may cause sciatic pain.

Of this series of fifty cases of so-called sciatica, forty-nine showed a definite evidence of a lesion of one of the joints of the lower spine, which include the lumbar articulations, the lumbosacral joint and the sacro-iliac joints. Also there is definite evidence that the lesion of the spine has a direct connection with the pain in the sciatic nerve, as is shown by an increase in the pain when there is an attempt at motion of the joint involved. One case out of fifty showed no evidence of a spinal lesion, but presented the characteristic evidence of carcinoma of the prostate. This case is included and helps to emphasize the point that there is always a definite cause at the origin of the nerve and not a perineuritis along the course of the nerve.

There are seventeen cases out of fifty which I have classified as acute strain of the lower spine. Most of these represent an acute lesion of one of the sacro-iliac joints, the sciatic symptoms sometimes coming on acutely secondarily to a chronic or recurrent strain of this joint. Two of these patients were first examined after having had severe sciatic pain for over a month, when they presented a sacro-iliac joint so sensitive that the slightest pressure caused intense sciatic as well as joint pain. And yet the patients told me that this was the first time that any one had ever examined the back. This is so because we have been taught to accept the term sciatica as a clinical entity, and that there was no need of examining further.

There were twenty-one cases out of fifty that are classified as chronic strain of the lower portion of the spine. It is more difficult in this group to connect the sciatic pain with the spinal condition, because the history is often misleading and sometimes shows no direct connection. But in every one of these cases there was definite evidence of a joint lesion, as shown by loss of motion and pain on motion, and it was possible to demonstrate an increase of sciatic pain when the affected joint was moved. It is in this group that we see the so-called sciatic scoliosis, which is perfect evidence of a joint lesion. It is not rational to explain the scoliosis as secondary to the sciatica when they are both symptoms of a joint lesion.

The third group is classified as hypertrophic arthritis, the diagnosis being based on the fact that the Roentgen-ray shows definite overgrowth of bone in the region of the lower lumbar spine, which corresponds to the facts as shown on physical examination. In this group there were eight cases out of fifty. It is not necessary to discuss this group, because all the textbooks recognize that definite spinal lesions may cause sciatic pain.

The last group, four out of fifty cases, were proved cases of tuberculosis of the lower spine in adults. It is of interest to note that two of these four patients were treated for a year for idiopathic sciatica, and the diagnosis was mistaken because some one was satisfied with the accepted theories. It would have been easy to detect a joint lesion as soon as the sciatic pain commenced in these cases, even if it were not possible to diagnose the character of the bone lesion, because there must have been evidences of joint trouble previous to the involvement of the nerve.

It is not the presumption that the only cause of sciatic pain is a joint lesion, but on the basis of these cases it is evident that the joint lesion is very frequently overlooked and its importance not recognized. Of course, it is perfectly irrational to treat the resulting pain, which is advocated in numerous textbooks and current literature, when the trouble lies in the spine. Nobody would think of treating the sciatic pain after he recognizes a tuberculosis of the spine, and therefore the sciatica should not be treated as such when there is definite evidence of a joint strain, which can certainly cause sciatic pain.

The conclusions from this study are two:

First, there is no clinical entity which is commonly called idiopathic sciatica. The evidence is very strong that the accepted theory of a perineuritis due to some inflammatory condition of the nerve sheath is not proved, and that there is always a definite cause at the origin of the nerve. The most common cause of sciatic pain is a definite joint lesion.

Second, if we have to use the term sciatica, and we undoubtedly will, then it should be a part of the orthopedic teaching. One of the chief reasons why there is so much confusion is because it is not well taught, and our knowledge is gathered chiefly from textbooks. It should be in the orthopedic textbooks.

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ABSTRACT OF DISCUSSION

DR. LEONARD W. ELY, San Francisco: I teach my students that there is no such disease entity as sciatica. Sciatica means pain in the sciatic nerve, a symptom, not a disease. Then they go to other departments, and find that it is treated as a clinical entity, by means of electricity, massage and drugs. In almost every case, however, a cause for the pain can be found. When we cannot find a cause, we acknowledge our ignorance, and do not attempt to hide it by calling a symptom a disease. It is high time that sciatica and intercostal neuralgia followed "belly-ache" and "acute bilious attacks" as diagnoses into the scrap heap.

DR. MELVIN S. HENDERSON, Rochester, Minn.: I heartily agree with what Dr. Rogers said, and partly with what Dr. Ely said. I believe, however, that there is a definite group of cases in which you cannot find any cause for so-called sciatica. What are you going to do with these cases? I try to locate the cause, but sometimes cannot do it, and should like to know whether any one else can do so always. Occasionally I have found that the injection of saline solution cured a small percentage. I try it in that particular group just mentioned, after I have tried out all other methods. The occasional cure secured seems to me to justify the procedure, as it is devoid of danger if carried out according to the method of Patrick.

DR. JOEL E. GOLDTHWAIT, Boston: It might be a matter of interest from the point of view of history to know that at the Massachusetts General Hospital, a number of years ago, these patients were sent to the orthopedic department, not at the request of the orthopedic surgeon but of the neurologist, who said that eight out of ten of these patients belonged to the orthopedic department, and it was not worth while for them to be sent to the neurologic department first, only to be referred elsewhere. He thought it better for the orthopedic department to have to send two patients to the neurologic department than for the neurologic department to have

to refer eight to the orthopedic. That was the attitude of the neurologist years ago. These requests came from the neurologists themselves; and I am under the impression that a smaller proportion of the total number of these patients would now be claimed by the neurologists than at that time.

DR. ROLAND MEISENBACH, Buffalo: I must agree with Dr. Rogers. I was very glad to hear him speak of sciatica as a symptom. I am willing to acknowledge that there is such a condition as sciatica, but I wish to emphasize that it is rare, that when we have sciatica in any way present, it is usually present as a symptom, due to some other cause than sciatic nerve inflammation. One of the best illustrations of this is the sciatica in cases of hypertrophic arthritis, in which the lumen through which the sacral nerves pass gradually became smaller due to the hypertrophic pressure. Loose pelvic joints are frequently the cause. Sacro-lumbar, or even lumbro-lumbar joints may have a direct bearing on the symptoms of sciatica. We must not forget our anatomy and the relation of the lumbar plexus to the sciatic nerve and to the spine. I do not believe that the injection of saline into the sciatic nerve would permanently relieve cases in which the sciatica may be the chief symptom, but in which there are other conditions, as a loose sacro-iliac or a disturbed sacro-lumbar joint present. However, the injection of novocain may temporarily relieve the patient, but the symptoms will recur. Whenever we see a case of sciatica, it is our duty to search for the cause, and not treat the symptom.

DR. JOHN RIDLON, Chicago: I have had the pleasure of having to be a month in bed for this kind of pain at least ten times. I have not had Pott's disease, or osteartritis of the lumbar spine, or a slipped sacro-iliac joint; so the pain was not due to any of these. I think that this shifting of the name of sciatica to a strained sacro-iliac joint is not by any means clearing up the question of painful backs.

DR. JOHN PRENTISS LORD, Omaha: I agree with the majority here that mechanical causes are back of a large proportion of these cases, but I have found that we must consider the patients as individuals the same as we consider those who have pains elsewhere. Some of these pains are toxic. The mechanical condition is not the only one present. The patients are frequently anemic. Some do not eliminate properly. In one notable case in Omaha, the patient had tried all methods of cure; liquid paraffin relieved his intestinal stasis, and as soon as elimination was properly established, his pain disappeared. I think that we must not forget that we are not merely manipulators, but are still doctors. We must recognize the fact that some patients need treatment besides the particular treatment that comes under our specialty. I believe that in some cases in which the pain is inexplicable and you cannot find a cause for it, if you treat the patient in a sensible way recovery may be expected.

DR. FREDERICK C. TEST, Chicago: I differ with Dr. Rogers only in regard to the percentages of the causes that he stated for this pain. In my experience, which comprises approximately fifty cases of distinct pain referred to the lumbosacral region, I have not been satisfied that I have had many loose sacral joints. I found that I had to look for the cause higher up, and have almost always discovered an elongated transverse process of the fifth lumbar vertebra. Sometimes this is present on only one side, but very frequently on both, perhaps associated with tilting of the lower spine and generally with stiffness, with pain usually shooting down one sciatic nerve or the other. In such cases, I occasionally find that there will be relief obtained by manipulation, either intentional or, as in two or three cases, the result of some movement on the part of the patient that seemed to free the transverse process and so relieve the pressure—temporarily, at any rate; and sometimes permanently—on the nerve roots. I remember a case in which there was pain in the lower back and extending down the right leg, and in which the roentgenogram showed a decidedly elongated transverse process on each side of the fifth lumbar vertebra. Operation was declined for the time being; and afterward, while lifting a pail of water from the floor, the patient felt a twist on the right side of the back, and the pain immediately left the right sciatic nerve, and temporarily went to the left. It has since gone from the left sciatic nerve, and she is now free from pain. Regarding the other causes that cannot be traced to a bony lesion, I personally feel that there is something, at any rate, in the matter of a toxemic neuritis from a focus of infection somewhere in the body. I remember one case in which I was particularly interested in which pain in the sciatic nerve came on three days after a nose operation. After the nose condition cleared up, the sciatica gradually disappeared, but has a tendency to return whenever there is a coryza.

DR. J. D. GRIFFITH, Kansas City, Mo.: I am treating now two patients in whom there is a marked sciatica recurring every now and then. I think that there are other causes for sciatica, in addition to the one that Dr. Rogers pointed out, in a number of cases. My cases belong distinctly to the type of enteroptosis. There was an enormously dilated and enlarged sigmoid; and the paresthesia, etc., followed whenever it was loaded. I have found relief by instituting hyperextension, prone hanging and the corset.

DR. FRANK E. PECKHAM, Providence, R. I.: I think Dr. Rogers' idea was to trace the sciatica to the sacro-iliac joint. Of course the joint is affected by trouble in still other regions; and you may get a toxic case, as described by Dr. Lord, with a real subluxation, as Dr. Ryerson probably has just described. I had two such cases; one was reduced under ether, presumably a subluxation, and the patient was well afterward and remained so. The other case was one of pain in the groin, which I have seen in quite a few cases. One manipulation without ether practically cured him; but these are unusual cases. As Dr. Lord says, we must study the patient. Although he has local symptoms, his trouble may be quite general. Another patient after many trials was cured by arch supports. There was a static strain, which is a condition we must consider. There are times when the ligaments require toning up and stimulating, which I do by various physicotherapeutic measures. I know of one case in a doctor who had recurrent attacks. By doing gymnastics morning and night, and hyperextending himself in bed, he has been clear of an attack for some time. I think that Dr. Rogers is correct in tracing the pain to the sacro-iliac joint, but this joint itself is affected by various infections, and we should look for, and treat these.

DR. JAMES T. WATKINS, San Francisco: Dr. Lord said that occasionally sciatica is of toxic origin. In confirmation of this contention, I should like to report a case I saw. The gentleman, an athletic person, had had recurrent attacks of sciatica for a long time. For four years he had been going the rounds of the physicians. In his youth he had had gonorrhea and was now obsessed with the idea that this was the cause of his trouble, despite the fact that the best genito-urinary men had found nothing wrong. I pointed out to him that nothing could be gained by duplicating the work which had been done by the exceedingly competent men who had preceded me in his case. We therefore undertook a new departure and had his mouth roentgenographed. My dentist friends advise me that there is no such thing as a healthy adult mouth. This man had pyorrhea and alveolar abscesses. I sent him to Dr. T. Sidney Smith. Dr. Smith advised certain work and that one tooth be extracted. This displeased the patient, so he consulted a dentist who had been recommended to him at his club. This man failed to relieve him. He ultimately returned to me and I sent him back to Dr. Smith. Then he had the tooth extracted. Prior to this he had attacks of sciatica every two or three weeks. Since removing the tooth and having his mouth treated efficiently an interval of some months has elapsed during which he has had no sciatica at all.

DR. ALBERT H. FREIBERG, Cincinnati: We must remember that a man has two sciatic nerves, and also many other nerves. Therefore, there is to be explained why a man happens to have a pain in one sciatic nerve. However much there may be a constitutional cause, either in the shape of infection or some constitutional disease, such as diabetes, it is only reasonable to suppose that there is a localizing factor to be found, if we only know where to look for it. Since we have been able, by modern methods and investigations, to study better the conditions of the spine, and the pelvic joints, and since we know the relationships of sacrolumbar cord and

sacrolumbar plexuses, we have eliminated a large percentage of the unexplained cases. We are called on in every case to tell why the individual has the pain in his right or left sacro-iliac region or his right or left sciatic nerve. I do not mean to say that I am always able to tell, any more than any one else. I can give the case a careful analysis by means of the Roentgen ray and other diagnostic helps; but I think that even in those cases in which we are unable to find the localizing factor, we must, nevertheless, assume that there is one that we should probably find with increase of knowledge. We must strive to explain, in every case that comes to us, why the individual has a pain in the sciatic nerve, and not somewhere else.

DR. REGINALD H. SAYRE, New York: We have been over almost all parts of the body, looking for the cause of pain in the sciatic nerve, but no one has mentioned the necessity of looking for fissures in the rectum, for carcinomas, for retroverted uteri, for prolapsed ovaries and dilated colons. Anything resting on the sciatic nerve and hurting it or the sacral plexus may cause this pain.

DR. ARTHUR LAWRENCE FISHER, San Francisco: I should like to emphasize a point in regard to the mechanism of the pain. We are taught that it is due to pressure. Unquestionably, in some cases, it is due to pressure on the nerve; but in others, there is a reflex from the joint, just as the pain in hip-joint disease is referred to the knee. The nerve which enervates the joint comes from the same segments of the cord as the nerve along which the pain is referred, which in this instance is in the sciatic nerve.

DR. MARK HOMER ROGERS, Boston: The chief point to which I wish to call attention is that the lesion is somewhere near the origin of the nerve, and not along the course of the nerve, as is commonly taught. I did not intend to lay stress on the importance of any one joint, namely the sacro-iliac. It is not any one joint but any part of the lower spine from which the nerve arises that is the primary cause. If you will examine the spine you will find a spinal lesion in a majority of cases. The strongest point that I have made is the fact that the neurologic department of the Massachusetts General Hospital has no record of a true case of sciatica in the last six months, whereas formerly they had many hundreds.

Disease Not a Respecter of States' Rights.—The greatest asset which our country can have is the healthy American citizen, and, valuable as it may be to increase the health of live stock and vegetation, it is of far greater importance that we throw every possible safeguard about the health of the man who is responsible for that live stock and vegetation. The argument has been advanced that since the States at the time of their entry into the Union reserved to themselves their police powers and since the administration of health is one of the police powers, that the states should themselves grapple with their own health problems and conquer them, and that it is therefore improper for the federal government to make appropriations the application of which will react to the health of states. This argument is fallacious in the extreme. As I have previously pointed out, this problem is not a purely intrastate problem. Milk which is produced under insanitary conditions in New Jersey may produce an epidemic in New York. Butter or cheese which is made under insanitary conditions or from polluted milk in Wisconsin or Illinois may produce disease in Virginia or the District of Columbia. Lettuce or watercress which is grown in soil which is polluted with human excrement may be shipped in refrigerator cars to a distant point and there produce an epidemic of typhoid fever. The man who contracts typhoid fever on a farm in Texas may become a chronic typhoid bacillus carrier and distribute the disease wherever he goes no matter what the state or what the city. Disease has absolutely no regard for state lines whatsoever. Disease is equally uninterested in states' rights. Sewage poured into a river in one state is easily carried by that stream to another state. So I say to you that the problem of rural sanitation is not a local problem but one which concerns the health and the physical integrity of our entire nation.—Senator Joseph E. Ransdell, of Louisiana, in the U. S. Senate, July 14, 1916.

A REPORT ON THE TREATMENT OF PERNICIOUS ANEMIA BY TRANSFUSION AND SPLENECTOMY*

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It is difficult to appreciate the fact that pernicious anemia is at present an incurable and fatal disease which in some respects is more to be dreaded than cancer. Its relapses, remissions, and merciless progressive course impress on us the necessity for a universal study of its manifestations. A thorough trial of splenectomy in the treatment of pernicious anemia is therefore warranted, though a consideration of the results is at present necessarily confused by fallacies and insufficient data. There is so far no evidence that splenectomy has cured pernicious anemia, but there are definite indications of consistent temporary improvement in a majority of instances.

Our early experience with splenectomy for pernicious anemia was discouraging. During the past two years, however, it has become evident that a marked reaction and a consistent temporary gain, at least for a period of months, follows splenectomy in selected cases, and surgical treatment has been more frequently suggested after a frank explanation to the patients concerning the course of the disease, the inadequacy of present methods of treatment, and the experimental nature of the procedure.

In February, 1910, the spleen was removed from a patient (A7040) who suffered from severe attacks of epistaxis and had a very large spleen, an icteroid tinge, and a blood picture of pernicious anemia including the presence of megaloblasts. Splenectomy was advised not with the specific idea of applying that treatment to pernicious anemia but largely because of the great size of the spleen and the somewhat indefinite characteristics of the blood picture. The patient did not report himself as improved, and died three years after operation with pneumonia.

Experience may show that cases of this type, in which there is a very large spleen, a hemolytic type of anemia, and a blood picture of pernicious anemia would better be grouped separately, as suggested by Moffitt,[1] but they cannot at present be omitted from consideration in a study of this character.

The remaining patients of this series were operated on between Aug. 1, 1914, and April 1, 1916. The records extended up to June 1, 1916, from twenty-three months to three months following operation; most of them, however, were for periods of less than one year.

Preoperative Transfusion.—Preoperative transfusion has been done in nineteen cases, from one to four transfusions having been given in each instance. A marked gain followed transfusion in eight cases. Very rapid and decided gains were seen in two patients. In one the hemoglobin rose from 10 to 40 per cent., with a gain of 2,000,000 red cells in one month; in the other the hemoglobin rose from 16 to 59 per cent., with a gain of 1,500,000 red cells in one month. Each of these patients received two transfusions. In six there were gains of only a few points, and in four there was no definite improvement. In one the hemoglobin per-

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* From the Mayo Clinic.
* Presented before the Association of American Physicians, May 10, 1916, Washington, D. C.
1. Moffitt, H. C.: Studies in Pernicious Anemia, Am. Jour. Med. Sc., 1914, 148, 817.

centage and erythrocyte count fell, but later, after splenectomy, improvement occurred.

In general, preoperative transfusions have proved valuable in improving the general condition of the patient and in favorably affecting the blood picture. The hemoglobin percentage and the red cell count have been moderately raised and the characteristics of the blood count favorably affected. Our knowledge of the hemopoietic system indicates that a consistently low leukocyte count with relative and absolute reduction in polymorphonuclear cells is to be interpreted as the result of severe injury to the bone marrow. Transfusion is usually followed by a gradual slight rise in the leukocyte count and an increase in the absolute number of polymorphonuclear cells. This reaction is not, however, to be compared in degree with that following splenectomy, which, on the other hand, must be considered in the light of postoperative leukocytosis in general.

TABLE 1.—SPLENECTOMY FOR PERNICIOUS ANEMIA

	Cases
Total (April 1, 1916)	31
Operative deaths (9.7%)	3
Recovered from operation	28
Marked and continuous gain after splenectomy during the first 3 mo. period	22
Number of cases recorded during second 3 mo. period	16
Number of cases maintaining gain during second 3 mo. period	11
Relapse	3
Postoperative deaths	5

Splenectomy.—That definite benefit for a period of months follows splenectomy in a high percentage of cases seems to be clearly indicated by a study of this series. Of twenty-eight patients recovering from operation, there was a gain during the first period of three months in twenty-two (78 per cent.). During the second period of three months, eleven (68 per cent.) of sixteen patients then living maintained their gain. This gain represents a satisfactory, and in several instances, a remarkable, improvement in the blood picture and the general condition. It has, however, little relationship to spinal cord symptoms or signs. Two living patients have maintained a satisfactory condition for one year, three for nine months and three for six months (Tables 1 and 2).

In the course of pernicious anemia, splenectomy seems to cause a more profound immediate reaction than any other form of treatment. This is demonstrated by our observations chiefly in three ways: (1) by an improvement in the blood picture and a change in its characteristics; (2) by a gain in the general condition, and (3) by a fall in the values of the blood-derived pigments in the duodenal contents.

1. *The Blood Picture.*—The very prompt occurrence of leukocytosis with a corresponding increase in the relative and absolute polymorphonuclear neutrophil count, together with showers of normoblasts, is indicative of a very marked reaction after splenectomy. The average leukocyte count in these cases within a few days of operation was 11,531. A very high polymorphonuclear count was almost constant. This leukocytosis persisted at least for a period of months. One month after operation it averaged 11,473. In cases of which we have record, from three to six months following splenectomy it averaged 10,283. The leukocytosis following splenectomy for pernicious anemia differs from the leukocytosis following operations in general both in degree and in persistence. The polymorphonuclear cells, it is agreed, have their origin in the bone marrow, and their increase may be either the result of bone marrow stimulation or of decreased blood destruction. No similar reaction is seen following transfusion.

Large numbers of normoblasts were found in the blood smears in twenty-five cases. The average was fifty-six in a count of 300 leukocytes. This is exclusive of one case in which 536 were recorded.

The gain in hemoglobin was gradual in most cases. The average gain in twenty patients, who showed satisfactory improvement, was from 38 per cent. just preceding splenectomy to 72 per cent. at periods varying from one month to six months following operation. In three patients it reached 90 per cent. or more.

The increase in the erythrocyte count ran parallel to the rise in hemoglobin. The average erythrocyte count in the twenty-two cases showing a gain was 2,000,000 just preceding splenectomy and 3,490,000 at periods varying from one month to six months after operation. In one patient it reached 5,200,000 cells; in seven it rose to over 4,000,000. This improvement was independent of preoperative transfusion, as is evidenced by the fact that nine patients in whom preoperative transfusion was not given showed an average gain of from 1,900,000 to 3,700,000. On the other hand, the greatest average gain was seen in thirteen patients as a result of combined preoperative transfusion and splenectomy — an average gain from 1,200,000 to 3,500,000. Postoperative transfusion has been given only in relapses, and not as a routine procedure.

TABLE 2.—SPLENECTOMY FOR PERNICIOUS ANEMIA: CONDITION OF PATIENTS IN THREE MONTH PERIODS AFTER OPERATION WITH RESPECT TO BLOOD AND GENERAL CONDITION*

	Case and No.		Date of Operation	Operative Death	Months 3	6	9	12	15
1	7040	E. P. F.	2/10/10	..	—	?	..	..	D†
2	112160	D. M.	8/11/14	..	+	+	−D	..	
3	98744	M. S.	12/ 2/14	..	−D				
4	122408	J. B. M.	1/22/15	..	−D				
5	124257	M. S.	3/10/15	..	+	+	−R	+	−R
6	127677	C. H.	4/17/15	D					
7	129678	O. D. B.	6/ 4/15	..	+	+	+	+	
8	129867	J. H. D.	6/ 5/15	..	+	+	+	+	
9	131876	E. S.	6/24/15	..	+	+	−R	D	
10	131991	R. C.	7/ 3/15	D					
11	130882	M. J. F.	8/ 2/15	..	+	+	+		
12	134484	W. G.	8/31/15	..	+	−R	+		
13	129095	F. L.	9/ 8/15	..	+	−R	+		
14	140045	G. L.	9/30/15	..	+	+	+		
15	142349	E. O.	10/ 1/15	..	+	+	+		
16	141771	H. F.	10/12/15	..	+	+			
17	142387	H. W. L.	10/15/15	..	—	+			
18	140670	W. A. S.	10/19/15	..	+	+			
19	133078	C. A.	10/25/15	D					
20	134732	J. M.	10/26/15	..	—	—			
21	147403	E. F.	12/31/15	..	+	+			
22	150807	W. E. B.	2/ 2/16	..	+				
23	151088	M. R.	2/14/16	..	+				
24	150239	E. S.	2/23/16	..	+				
25	151665	F. W. N.	2/24/16	..	+				
26	152922	W. H.	3/10/16	..	+				
27	152671	H. L.	3/15/16	..	+				
28	130512	C. G. T.	3/17/16	..	—				
29	154493	D. D. H.	3/23/16	..	+				
30	153395	L. C. H.	3/29/16	..	+				
31	151646	B. N.	3/29/16	..	+				

* In this table, + indicates gain, — loss, R relapse, and D death.
† Death 3 years.

It seems to be clear, therefore, that the blood picture is more decidedly and consistently influenced by splenectomy than by any other method of treatment. It has not yet been shown that this improvement is

more than temporary. A polymorphonuclear increase which persists for months, great numbers of normoblasts, and a gradual rise in the hemoglobin and the red cell count are most prominent.

2. *The General Condition.*—An improvement in appetite and in general strength has been noted during the early weeks following splenectomy. This has been recorded even before any decided improvement in the blood has taken place. The patients seemed to be less toxic. All but two promptly lost their icteroid tinge. Elimination or partial elimination of some product of altered metabolism or hemolysis would explain the change in the general condition. The psychic effect of surgical treatment has been minimized by a previous explanation of our incomplete knowledge concerning the results.

3. *The Fall in the Values of the Blood-Derived Pigments in the Duodenal Contents.*—The increase of urobilin in stools of patients suffering with hemolytic types of anemia and its marked decrease after splenectomy have been demonstrated by Eppinger[2] and his co-workers. The clinical importance of the estimation of urobilin in the excretions in various types of anemia is shown by the work of Wilbur and Addis.[3] The quantitative estimation of urobilin and urobilinogen spectroscopically in Wilbur and Addis units has been successfully applied to the duodenal contents by Schneider.[4] We have estimated the values of the blood-derived pigments in the duodenal contents of thirty-four patients, and our findings in general corroborate those of Schneider. The only results I report at this time were obtained in nine cases of this series. The very striking fall in the values of the blood-derived pigments after splenectomy would seem to indicate a favorable effect with respect to the hemolytic factor. The values frequently run parallel to the degree of icterus (Table 3). In one case the total estimation of urobilin and urobilinogen fell from 6,000 units before operation to 800, twenty-one days afterward; in another from 5,000 units to 200 units. That this marked reduction in bilirubin, urobilin and urobilinogen in the duodenal contents will prove constant is likely; that it will obtain at a later period, after splenectomy, we have yet no indication.

Can we formulate what might be termed a balance between the hemolytic and myelotoxic factors in a given case? Between blood destruction and blood production? The values for the blood-derived pigments, it would seem, should in some measure be an index of hemolysis; on the other hand, the characteristics of the blood picture, if we can properly interpret them, are doubtless expressive of the condition of the bone marrow. Decided fluctuations in the leukocyte count and in the characteristics of the differential count are seen in many cases of this series, both before and after transfusion, and before and after splenectomy. There is considerable evidence to indicate, however, that a consistently low leukocyte count with a reduction of the polymorphonuclear neutrophils is indicative of severe bone marrow insufficiency. Certainly a constant complete inversion of polymorphonuclear and lymphocyte percentages, that is, a very low polymorphonuclear percentage with a high lymphocyte percentage is an unfavorable indication, though it does not mean that a subsequent remission may not occur. If a patient with high hemolytic values is able, in spite of active hemolysis, to maintain a blood picture with favorable characteristics and only moderate anemia, there should be present an active bone marrow, and the case would appear to be a more favorable one for splenectomy. Irrespective of high or low hemolytic values, if the leukocyte count is consistently low with an inversion of the differential count, and the anemia extreme, showing no reaction after transfusion or medicinal treatment, the case would seem to be an unfavorable one because of probable advanced pathologic change in the bone marrow.

Age.—The largest number of patients (twelve) were between 40 and 50 years of age. One was in the second decade, three in the third, five in the fourth, eight in the sixth, and two in the seventh.

The progress of the patient in its relationship to age cannot at present be ascertained from a study of these cases. In general, the older patients presented less evidence of active hemolysis and more evidence of marrow damage. The patients of middle age were of both the hemolytic and myelotoxic types, while in younger patients hemolysis was usually active. The severity of the disease varied with the individual case irrespective of age, save that the oldest patients were prone to a chronic form with less definite remissions. While the younger patients probably are capable of more benefit as a result of bone marrow stimulation and an amelioration of the hemolytic factor, many patients of the fourth and fifth decades have shown remarkable gains.

TABLE 3.—ESTIMATION OF HEMOGLOBIN-DERIVED PIGMENTS IN DUODENAL CONTENTS, WILBUR AND ADDIS UNITS (SCHNEIDER TEST)

	Case and No.		Time Before and After Splenectomy	Color	Bilirubin	Urobilin	Urobilinogen	Total
5	124257	M. S.	12 months after	.....	+	400	0	400
22	150807	W. E. B.	37 days after....	Yellow	++	700	0	700
24	150229	F. S.	30 days after....	Yellow	+	1,700	0	1,700
25	151665	F. W. N.	34 days after....	Yellow	....	600	0	600
26	152922	W. H.	7 days before...	.....	+++	2,000	600	2,600
			21 days after....	Yellow	+	1,400	0	1,400
27	152671	H. L.	20 days before...	Dark brown	....	6,000	4,000	10,000
			14 days before...	Dark brown	....	5,000	1,000	6,000
			21 days after....	.....	....	800	0	800
29	154493	D. D. H.	9 days before...	Dark brown	+	3,000	2,000	5,000
			17 days after....	Yellow	....	200	0	200
30	153395	L. C. H.	9 days before...	Dark brown	+++	3,500	Trace	3,500
			24 days after....	Yellow	Trace	200	?	200
28	136512	C. G. T.	15 days before...	Dark brown	+++	2,200	600	2,800

Weight of Spleen.—The average weight of the spleens removed in this series was 422 gm., exclusive of two very large spleens weighing, respectively, 1,120 and 1,600 gm. In only two cases did the spleen weigh less than 175 gm. The very small spleen is usually present in the late stages of pernicious anemia, and a moderately enlarged spleen is generally found when hemolytic activity is marked. Splenectomy influences chiefly the hemolytic factor of the disease, and one might argue that the presence of a moderately enlarged spleen is a point of evidence in favor of splenectomy.

2. Eppinger, H.: Zur Pathologie der Milzfunktion, Berl. klin. Wehnschr., 1913, **50**, 1509, 1572, 2409. Eppinger, H., and Ranzi, E.: Ueber Splenektomie bei Bluterkrankungen, Mitt. a. d. Grenzgeb. d. Med. u. Chir., 1914, **27**, 796.

3. Wilbur, R. L., and Addis, T.: Urobilin: Its Clinical Significance, Arch. Int. Med., February, 1914, p. 235.

4. Schneider, J. P.: Splenic Pathology of Pernicious Anemia and Allied Conditions: A Duodenal Method of Estimating Hemolysis, Arch. Int. Med., January, 1916, p. 32.

Operative Mortality.—In this group of thirty-one cases there were three operative deaths, giving an operative mortality of 9.7 per cent.[5] There is no apparent reason why the operative mortality of splenectomy for pernicious anemia should not be low when a proper operative selection has been made. The spleen is relatively small, adhesions usually insignificant, and the technical procedures not difficult. The risk of surgical treatment is decidedly increased in patients with severe anemia, and every endeavor should be made to improve the hemoglobin to 35 or 40 per cent., and the erythrocyte count to 1,500,000 or 2,000,000 cells.

A consideration of the features presented by the three patients who died following operation reveals that one of them was distinctly not a case for surgical treatment. The hemoglobin was 19 per cent., even after two transfusions, and a consistently low leukocyte count was present. The other two operative deaths were similar in character, and presented unusually striking features. The patients died, on the third and fourth days, respectively, after having suddenly developed fever as high as 106 F. and delirium, in one case associated with hyperpnea and pulmonary edema, and in the other persistent vomiting with ultimate coma.

Postmortem examination in both instances failed to show a sufficient cause for death. These fatal attacks may have been the result of operation at a time of recrudescence or impending crisis; in one instance acidosis is a probability. Neither of these patients was in a weakened condition before operation, but both of them for two weeks previous to operation showed a falling hemoglobin, a decrease in the red blood cell count, and a low and falling leukocyte count, all of which would at the present time be regarded as points in evidence against a recommendation for surgery.

Postoperative Deaths. — Five patients: In two patients the downward course was not averted by splenectomy, and death occurred at home within three months. In one of these patients there was a slight gain in the condition of the blood, but a double femoral thrombophlebitis developed, and the patient died with septic manifestations. In the second patient there was no reaction either in the general condition or the blood, and a steady decline occurred. The spleen in this instance was very much above the average size for pernicious anemia, weighing 1,120 gm. A third patient died at nine months after decided improvement which was maintained for approximately six months. A fourth patient died at twelve months after gaining to 90 per cent. hemoglobin and 4,000,000 red cells and maintaining a good condition for seven months. The fifth patient died three years after splenectomy; his postoperative course was never determined.

Relapses.—Three living patients have had relapses, two within six months following operation after an improvement during the first period of three months, and one at fourteen months after recovery from a previous relapse at nine months. Two of these who were treated by transfusions at the time of relapse have again had remissions. Three additional patients have never shown evidence of definite gain since splenectomy.

5. Forty-seven splenectomies for pernicious anemia have been done up to Sept. 1, 1916, with three operative deaths, an operative mortality of 6.4 per cent. There have been no deaths in the last twenty-nine cases.

SUMMARY

1. There is no evidence that splenectomy has cured pernicious anemia.

2. A review of thirty-one cases of splenectomy for pernicious anemia demonstrates a definite gain in the blood, the weight, and the general condition during the first three months of the postoperative period in 78 per cent. of the cases; during the second three months' period, 68 per cent. of living patients maintained their gain.

3. A consideration of the advisability of splenectomy would seem to be warranted at present chiefly in young and middle-aged patients of good general resistance, who show evidence of active hemolysis and in whom the spleen is moderately enlarged.

4. The estimation of the blood-derived pigments in the duodenal contents is valuable in determining the degree of hemolytic activity present at a given time. A comparison of the degree of hemolysis with the severity of the anemia would seem to be indicative of the productive power of the bone marrow.

5. Preoperative treatment, especially transfusions, should be employed to influence the general condition of the patients and to improve the characteristics of the blood picture. The operative risk is increased when the hemoglobin is below 35 per cent. and the erythrocyte count less than 1,500,000 cells.

6. Postoperative transfusions have not been given as a routine procedure, but transfusions have been successfully employed in postoperative relapse.[6]

THE PHYSICOCHEMISTRY OF THE GONOCOCCUS

IN RELATION TO IMMUNITY AND THERAPEUSIS *

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In an earlier paper[1] before this section there were submitted arguments, based on experiments, tending to support the conclusion that all forms of serums and vaccines hitherto employed against gonorrhea were without definite dependable value, and apparent reasons for their failure were emphasized. Work of the past year tends to confirm these opinions and leads to further generalizations.

Starting from the fact that a true and lasting immunity against gonococcus infections is found in all animals and, as a rule, in all tissues of man, save only in certain special tissues, we pass on to observe that

6. In addition to the references already given, the following will be found of interest:
Archibald, A.: Transfusion in the Treatment of Pernicious Anemia, St. Paul Med. Jour., 1916, **18**.
Balfour, D. C.: Indications for Splenectomy in Certain Chronic Blood Disorders: The Technic of the Operation, THE JOURNAL A. M. A., Sept. 9, 1916, p. 790; The Spleen in Its Relationship to Pernicious Anemia, Splenic Anemia and Hemolytic Jaundice, Canad. Med. and Surg. Jour., 1916, **40**, 47.
Krumbhaar, E. B.: Late Results of Splenectomy in Pernicious Anemia: A Statistical and Critical Review, THE JOURNAL A. M. A., Sept. 2, 1916, p. 723.
Lee, R. I.; Minot, G. R., and Vincent, B.: Splenectomy in Pernicious Anemia: Studies on Bone Marrow Stimulation, THE JOURNAL A. M. A., Sept. 2, 1916, p. 719.
McClure, R. D.: Pernicious Anemia Treated by Splenectomy and Systematic, Often-Repeated Transfusion of Blood: Transfusion in Benzol Poisoning, THE JOURNAL A. M. A., Sept. 9, 1916, p. 793.

* Read before the Section on Genito-Urinary Diseases at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Warden, C. C.: Vaccine Treatment of Gonorrhea, THE JOURNAL A. M. A., Dec. 11, 1915, p. 2080.

unquestionably these receptive tissues in man are occasionally proof against infection, and appear to depend for their immunity, not so much on the presence of antibody, as on the existence of certain physical states within themselves and their fluids. But in the present state of our knowledge we cannot hope to obtain an artificial immunity by any biologic method of treatment greater than that afforded by an attack of the disease itself, which, unfortunately, is negligible. This statement is true in general of all infectious diseases, diphtheria being a type of exception, but those caused by members of the family of *Coccaceae* are especially apt to be recurrent. It is strikingly apparent that an immunity such as may be induced against the *B. typhosus* group, for instance, is unknown against the coccus group. Unquestionably the reaction between germs and body fluids in the latter is of a somewhat different nature.

I wish here to summarize my observations on the chemicophysical relations of the gonococcus to fluids in the laboratory and within the body, all of which are concerned as factors in the life of the cocci.

The gonococcus is regarded as a cell composed of substances in a colloid state, having an extremely soft, delicate body and limiting surface extraordinarily sensitive to changes of osmotic pressure and surface tension. When directly observed microscopically during active growth on artificial medium the cocci never have the appearance observed in smears of gonorrheal exudate, or in smears made after the removal of a colony from the medium, but their contours strongly suggest an ameboid state. This deformity in contour is due, however, not to inherent ameboid power of the cocci, but rather to the influence of surroundings. The conditions are strikingly similar to those existing in an oil-in-water system, that is, a heavy emulsion of oil in water, where the droplets of oil in dispersion are so closely packed as to assume polyhedral shapes. Indeed, the gonococcus is quite comparable to an oily globule. The microscope shows also the distortion of contour exerted by the "pull" of such substances as oil, glycerol and sugar solutions.

I have shown[2] the gonococcus to contain various chemical substances which constitute an entity comparable to other cells of the animal type. There is little or no unsaponifiable matter, like phytosterol or other higher alcohols, such as are found in large amounts in some other micro-organisms, notably in the tubercle bacillus. We may regard the gonococcus as a cell the content of which is soluble in and homogeneous with the surface membrane or limiting layer, even though the latter may preponderate in fatty constituents, which may, in turn, be soluble in and miscible with external agents, such as fats, soaps and fat solvents. The surface membrane or layer is semipermeable, that is, permeable to water under certain conditions, and probably some crystalloids, but probably impermeable to most colloids, including its own. Throughout my reports there has been made use of the comprehensive, or at all events, collective term "fats" for want of a better one. This word is intended to include an order of chemical substances and compounds comprising those known as oils, containing fatty acid radicals in their structure, the acids and their salts, and those of more complex character, also, built about the fatty acids, called "lipoids," a term which, says Leathes, is a cloak for ignorance and an indefinable limbo into which any one can thrust anything of which he knows little or nothing, including what is often not a compound of a fatty acid at all. These fats form a group separate, and almost without exception, distinct from those other classes of compounds, the carbohydrates and proteins, all of which collectively make up the living plasma. The fats peculiar to the gonococcus have been, in part, described earlier.

The protoplasm of the interior of the cell probably consists of a colloidal aggregate dispersed in a watery external or continuous phase, while the behavior of the limiting layer strongly suggests the reverse type in which water is the disperse phase in an external fat-protein phase. This condition is comparable to the physical systems of water-oil mixtures. In the interior of the cell is the oil-in-water emulsion, in the limiting layer the water-in-oil emulsion. A nice illustration is offered by Clowes, in which the former state is like a group of islands surrounded by water, and the latter like a cluster of lakes surrounded by land. In the first the permeability to water is free, in the second it is conditioned. The conditions which regulate the permeability are for the most part due to the influence of electrolytes, to surface tension changes, and to what Loeb calls the driving force of osmotic pressure. On these depend the life or death of the cell.

A suspension of gonococci in water constitutes a suspension colloid (suspensoid) and the cocci are anions, that is, they carry an electronegative charge. From such a dispersed state or phase the cocci may be flocculated (agglutinated) and undergo electrical change by cations, the flocculating power of which increases directly with the valence, i. e., hydrogen, calcium and aluminum. The agglutinating property of so-called immune serum is exceedingly variable and unreliable. It is equaled and even surpassed by various normal serums. Gonococci suspended in solutions of various electrolytes behave in manner comparable to cells of animal tissues to electrolytes. The electrolytes functionate in the two divisions as made by Osterhaut. Anions, such as hydrogen dioxid, sodium hydroxid and potassium hydroxid, increase the permeability of the cell. Sodium chlorid acts as an anion, since the chlorin ion is more readily adsorbed than the sodium ion. These anions, let us observe, promote the formation of emulsions of oil in water, such as we conceive to exist in the interior of the gonococcus cell, and their action on the cell is destructive. On the other hand, cations, such as calcium, decrease the permeability of the cell, tend to promote the formation of water-in-oil emulsions, such as we believe to exist in the surface film of the cell, and may be protective. Gonococci, in the presence of solutions containing antagonistic electrolytes, such as sodium hydroxid, and sodium chlorid or sodium hydroxid and calcium chlorid, tend to become agglutinated and in a degree protected, or undergo autolysis and destruction in proportion to the concentration of calcium and hydroxid ions. Isotonic mixtures, such as Locke-Ringer solution, particularly if containing a little protective colloid, such as gelatin or agar, exert no immediate change in permeability and tend to preserve the cocci. I was so impressed with this fact years ago that I advocated such a mixture as a culture medium. Anesthetics, such as alcohol, ether and chloroform, exert solvent power for fat in higher concentrations; in low concentrations they act like calcium ions, producing agglutinative, protective effects. Gonococcus

2. Warden, C. C.: Jour. Infect. Dis., May, 1915.

grows well in the presence of small quantities of alcohol.

In all fluids in which water in excess is available, that is, in which the surface tension is high in the external phase, the cocci undergo autolysis and disintegration, primarily by reason of the semipermeable membrane. Rupture of the cell due to distention by water depends in part on the weakness of the outer envelope. If once excess of water gains entrance to the cell, electrolytically dissociated salts of protein may be formed by hydrogen or hydroxid ions of water, or by acid or alkali, and there is induced further swelling of the cell, due to the affinity for water of the protein ion. In addition, some of the volatile fats of the cell are soluble or miscible with water and create a state tending to promote disintegration. It is probable that the proteolytic ferments of the cell do not participate in the destruction to any extent during the life of the coccus.

If the membrane is permeable to a solute of the outer phase, yet impermeable to its own cell contents, the ultimate state will be as if the outer fluid were water alone, since the concentration of the diffusible solute is soon equal on both sides of the membrane, whereon water is absorbed freely. Hence suspensions of gonococcus in physiologic salt and various weak solutions behave similarly to suspensions in water. With reference to the influence of osmotic pressure and surface tension on the gonococcus, it is interesting to observe the behavior of the latter under varying conditions of these forces. Within the leukocytes, as in smears from gonorrheal exudate, the osmotic pressure of the white cell exceeds that of the coccus, the latter loses water and its surface tension is higher than in the surrounding medium. In the presence of cations in solution, and of all fluids in which the cocci assume and maintain an approximately spherical contour, the surface tension is greater than that of the external fluid at the interface between the two. On the contrary, the high surface tension of pure water and weak salt solutions and the greater osmotic pressure within the cocci cause their lysis and disintegration.

On suitable culture mediums, and undoubtedly in the fluids of the body, the surface tension and osmotic pressure of the coccal cells are low, but about equal to those of the environment. Through slight variation in the surface tension and osmotic pressures of the culture medium it is possible to study the reaction of the cocci through nice gradations from one extreme, at which all cocci autolyze and no growth occurs, through stages wherein colonies attain a certain size before all individuals composing them undergo lysis, giving the appearance of having "exploded," to the other extreme of optimum development.

It is important to note the reaction of the gonococci to fats. Neutral fats exert a protective influence. The fatty acids in high concentration cause flocculation similarly to that produced by other acids and hydrogen ions. In low concentrations, as 1 to 10,000, the agglutinative power is in abeyance and the surface tension at the interface between coccus membrane and water is lowered. In addition there appears to be an adsorption of the acid by the coccus, together with solution of the former in the cell surface, or, in other words, a combination is formed whereby the permeability of the membrane is increased and the cell subsequently destroyed by imbibition of water. The same applies to the salts and esters of the fatty acids in varying degrees. The sodium and potassium salts of oleic acid are fatal to gonococcus through lysis in dilutions of 1 to 5,000, and the same effect is produced by salts of linoleic acid in concentration of 1 to 7,500. In this connection it is noted also that the fatty acids and alkali salts of the fatty acids composing the gonococcus exert even a greater effect, which may be taken to indicate a higher degree of solubility in the surface film.

In general it may be said that the observations of Bancroft on the effects of the soaps on oil and water mixtures apply to the gonococcus. Sodium soaps raise the surface tension of the oil, lower that of the water and tend to produce emulsion of oil in water. Applied to the gonococcus, whose surface area we regard to be in the form of an emulsion of water in oil, sodium soaps tend to reverse the type, thus increasing the permeability of the membrane. Calcium soaps, on the other hand, tend to produce emulsions of water in oil comparable to that existing at the surface of the gonococcus, and are thereby protective in their action. The reversibility of colloidal states is a very important factor in the life of all cells.

A suspension of gonococcus in serum or plasma, in vitro or in the body fluids in disease, constitutes the disperse phase of a suspensoid within another suspensoid (colloid). Each colloid may, and under proper conditions does, react on the other, leading to certain changes in the physical state of both. Some of the changes are in a measure "specific" for the gonococcus; others may be produced as well by inert substances, such as starch, agar, kaolin and charcoal. Let us examine a little closer the relation of the gonococcus to serum and body fluids. The bodies of the cocci are in contact with a fluid of complex nature. The surfaces of the cocci have become the disperse phase in a water suspensoid containing isosmotic values about equal to that of sodium and calcium salts, protein in a highly disperse state, sugar in solution, fats, fatty acids and soaps. Laboratory observations indicate that the influences which operate on the gonococcus in water and various salt solutions also obtain with suspensions in serum. Increase in water content of the external phase (serum) and corresponding decrease in concentration of salts and other matter produce effects approaching those caused by water, whereas increase in ionic fat or soap content exerts influences comparable to what are felt on addition of these substances to water.

Through the phenomenon of adsorption the gonococcus membrane may in such colloidal solutions become more impermeable to water, leading to the checking of autolysis in laboratory experiment and tending to prolong or insure the life of the coccus in the body fluids. On the other hand, the fact that there appears to be only very slight diminution of lysis of gonococcus in suspension in normal serum leads one to conclude that the adsorbed substances, partly of a fatty nature, may not materially decrease the permeability of the surface membrane or protect the cocci. Theoretically the adsorbed fats, being more or less readily soluble in the gonococcus membrane, would tend to increase the permeability, and show that the fats may serve, at any rate in part, as a protection to the body. In this connection it is not without interest to bear in mind the well-known clinical effects of fat solvents, such as alcohol, on the course of gonorrhea and other infectious diseases, and the laboratory effects, as shown in the disappearance of complement fixation reactions.

The gonococcus is able to survive and propagate in a nutrient colloidal medium in which the balance of surface tension, osmotic pressure, density and other physical conditions in both is properly maintained. The balance is a nice one and slight variations in the physical state of the medium may destroy this balance and kill the organisms. Experiment indicates that on suspension of gonococci in fresh normal serum the germ bodies adsorb from the serum certain substances in part of a fatty nature, but that these fatty substances are of a different character from the fats of the cocci. The serum which has been subjected to the suspension of cocci in it becomes toxic, and kills the animal from which it was drawn, the homologous animal, in anaphylaxis. There is every reason to infer that a like though less severe phenomenon may occur within the body during the course of gonorrhea.

The gonococcus undergoes lysis to a greater or less extent in serum in laboratory experiments, and unquestionably the same is true at certain stages in the course of the infection within the body fluids. The serum therefore gains, besides protein and other substances not necessarily toxic, fats from the cocci. The protein constituents of the gonococcus appear to exert a negligible so-called antigenic effect on the body. The fats, on the other hand, produce considerable influence, though probably of a different kind. I have shown previously that the gonococcus fats serve as antigen in the complement-fixation. It is inferred that this phenomenon is due to the influence of these fats on the body fluids. It is apparent that this influence is not only brief, but is also not continuous, or rather that the gonococci undergo periods or waves of increased lysis and that these periods are synchronous with periods of positive complement fixation and with clinical signs of increased activity of the cocci, as shown by increased discharge and the numbers of them in the smears. Observations lead me to infer that an interrelationship exists between aggravated first-stage symptoms, lysis and excess of gonococcus fats in the body, and positive complement fixation on the one hand, and the following amelioration of symptoms, negative complement fixation and disappearance of the cocci and their fats on the other.

That the presence of excess of gonococcus fats in the body fluids is in relation to clinical improvement and even destruction of all cocci present may be explained by the fact that the substances that easily obtain entrance into the cell are in part, aside from water, just those that are soluble in fats or miscible with them. The fats of the gonococcus themselves are naturally most soluble and miscible of all, and if the surrounding fluids or serum contain sufficient of them, or excess over the ordinary fats of the serum, it becomes possible for the permeability of the cell membrane to be increased and destruction of the cell by water or other agents to ensue. In this connection it should not be forgotten that the solubility referred to may be only a more or less relative term to designate a surface tension and adsorption effect leading to modifications in the colloidal state of the membranes.

I stated in a previous paper before this section that excellent clinical results had followed in my hands the administration of the gonococcus fats in an oil menstruum. It is believed the foregoing conclusions may afford a working hypothesis for the fact. As control on the action of various fats following inoculation I have found that apparently no therapeutic effect is exerted by such neutral fats as olive, cottonseed, cocoanut, cod liver and linseed oils, or by the administration of such unsaturated fatty acids as oleic and linoleic in doses of 0.1 gm. dissolved in oil. One fact learned from these experiments controlled by similar injections into laboratory animals is that parenteral injection of oils and fatty acids result in a partial local conversion of the free acids into the corresponding sodium salts.

Complement Fixation: The antigen composed of the gonococcus fats dissolved in alcohol has now been tested in over 1,900 cases. The work has been delayed partly by the difficulty of making sufficient of the antigen, the process requiring immense quantities of culture material, and partly because I was not satisfied with it. As was said a year ago, the question whether the fats as employed might not contain traces of protein did not then concern us, but later the question demanded an answer. Accordingly the presence of a protein rest was eliminated by converting the fats into the sodium salts of the fatty acids and purifying them repeatedly from alcohol. These salts, dissolved in alcohol, were found to possess much better antigenic power than the original. This antigen therefore has been used as control in our work and has substantiated the conclusions we formed a year ago. The expense and labor incident to the preparation of the antigen was the next difficulty to be overcome. This was done in the following manner: A study of the gonococcus fats showed them to possess certain physicochemical characters, acid values, molecular weights, melting and solidifying points, iodin values, etc., and indicated their relative proportions in combination. From these data it was possible to combine fats with identical values in the proper proportions. After some practice with tests alongside the control antigen this synthetic or artificial antigen was found to check perfectly and has since been employed in several hundred tests. As with the control, it was found also that alcoholic solution of the sodium salts of the fats composing the artificial antigen gave better results. A review of the cases tested with these antigens will form the material of a paper by Dr. J. B. Kelly and myself.

The foregoing facts lead to the question of the treatment of gonorrhea by the fats. Since my last paper no systematic work has been done, owing to the difficulties already mentioned and the necessity for centralizing effort on the study outlined. From our past experience and from the theoretical considerations arrived at I am convinced that the method of treatment warrants a fair and extended trial. The plan contemplates treatment with the gonococcus fats so far as is practicable and with the artificial combination in particular, since the latter affords less chance for variation in product and more accurate combination by weight. There is also indicated treatment with the salts of the artificial fats, preferably intravenously, as experiment has shown that in therapeutic doses so administered these salts, easily emulsified in salt solution or water, are harmless to animals.

With regard to theoretical and practical considerations of the phenomena concerned in the response of the body to gonococcus infection, in complement fixation and in therapeutics, I am convinced that hard and fast ideas of the so-called antigen-antibody combinations, amboceptors, etc., should be modified, or perhaps better, abandoned altogether. The problems are bound up with those physicochemical phenomena of surface tension, osmotic pressures, permeability and

solubility and the interaction of colloidal solutions in general, including anaphylaxis. In respect to anaphylaxis it should be borne in mind that recent experiments indicate there is probably no difference between specific anaphylaxis, namely, that produced by the same substance as the inducing substance, and the ordinary nonspecific anaphylaxis induced by almost any substance leading to change in the physical state of the body fluids. In practice I have frequently observed in patients the symptoms of anaphylaxis as evidenced by chill, fever and urticaria following inoculations of gonococcus substance in various forms subcutaneously and intravenously. These symptoms have been regarded as manifestations of nonspecific anaphylaxis, since they were produced by control intravenous injections of distilled water and the shock itself unattended by appreciable modification of the infection. This ordinary shock is identical with that induced by water, agar or kaolin injections in laboratory animals, and that frequently recorded in recent years following intravenous injections of various serums and certain other therapeutic agents. The contention of Gay and others that beneficial effect in such cases is due to results of this shock of ordinary type seems to lack sufficient support.

The physicochemical entity of the gonococcus reacts with the serum complex in a definite manner, inducing certain changes in each, which operate, on the one hand, to viability of the germs, on the other, to their extinction, depending on a shift of balance between forces in which the fats undoubtedly play an important rôle. Into this view is admitted the specificity of antigen, but I am inclined to dispute the antigen-antibody idea as ordinarily understood. The solution of the problem is found in less vague processes.

It is perhaps not inadmissible at this time to state that the ideas expressed here with reference to the gonococcus may be found serviceable in work on other bacteria, particularly on other members of the *Coccaceae* group, but also on organisms rich in fats, which produce such changes in the serum in disease as to lead to complement fixation with fat antigens. Only recently we have produced in the laboratory an artificial syphilitic antigen for use in the Wassermann reaction. This antigen has been tested and made to agree with two standard antigens, consisting of alcoholic extracts of human heart, which had been shown to agree with each other. From the facts noted there is drawn the tentative inference that the fixation of complement in gonorrhea and syphilis is due to the influence of fats alone.

ABSTRACT OF DISCUSSION

Dr. Louis E. Schmidt, Chicago: Warden reiterates "that all forms of serums and vaccines hitherto employed against gonorrhea were without definite dependable value." I need not enumerate the various agents included in this category — as I include them all — and wish to emphasize that any and all have not come up to expectations in clinical work. Whether or not Warden's exhaustive and painstaking work is sufficient to explain the reasons thereof yet, I believe it points out the error of our ways, when it comes to the promiscuous use of serums and vaccines in gonorrheal diseases. He must give still more evidence in regard to the "fat" of the gonococcus before it can be regarded as a specific in treatment. As to the antigen, I must admit that it has shown itself superior to other antigens and for this reason the "fat agents" may also be proportionately better than the serums and vaccines used previously. Certainly, the theoretical and practical bearing of the problems of chemicophysics on immunity deserves the most careful consideration. There can be no question that the finding of the specific antibody in the blood gave rise to the theoretical basis of vaccine treatment. For this reason all the serums and vaccines whenever used have been to some extent controlled with gonorrheal complement tests. To some extent symptoms and signs are in accord with this view. It was noticed that following injections of certain agents, a rise in temperature was not uncommon. Many cutaneous reactions occurred, local reactions became more pronounced and then lessened in severity. Yet with all this evidence there has always been a belief that many satisfactory results have not been based on the action of specific antibodies and much experimental and clinical work has been done to show that certain albumins have given favorable results and in most instances that following the injection thereof the rise in temperature has been noticed and that the changes thus produced were the cause of the improvement. In my opinion there is no question that vaccines and serums of all types that have been used in gonorrhea and its complications have not come up to our expectations.

Dr. Edward L. Keyes, Jr., New York: I have been guilty of expressing in print great confidence in various kinds of vaccines and serums. At the present moment I do not feel any confidence in vaccines or serums. I have arrived at the same conclusion as Dr. Warden and Dr. Schmidt.

Dr. Benjamin Gruskin, Chicago: I have used Warden's antigen in connection with other gonorrheal antigens. In fifteen cases, nine that were negative or faintly positive with other antigens showed a sharper reaction with Dr. Warden's antigen. Other cases that I would have thought negative I have been able to report as positive, and the clinical history, as the doctors reported to me afterward, proved that the patients had had gonorrhea a year or so before. I find it the best antigen I have ever used.

Dr. Theodore Baker, Pittsburgh: I have had some apparent success with vaccines, and, using the same technic, have had failures. On reviewing the histories of the cases that had been a success and those that had been failures I found one significant fact. In those that had been a success the vaccines produced a marked local and a marked general reaction. In those that had been failures there was the very slightest reaction with large doses of the vaccine, or no reaction at all. I found also that by keeping the vaccines on ice they lost their potency. I think that specific vaccines are still worth trying. We should be cautious in using other nonspecific proteins and giving up the general use of specific vaccines, as has recently been attempted.

Dr. John R. Brown, Tacoma, Wash.: We have tried autogenous vaccines, stock vaccines, simple vaccines and mixed vaccines, and I am satisfied that they have not made good. Occasionally I have seen a case where they seemed to do some good, and those are the cases, as mentioned by Dr. Baker, that gave an intense reaction. Therefore, if we are going to expect any good at all we must use larger doses than those advised, or at least large enough to cause not only a local but a constitutional reaction. I also think it does not make much difference what organism you use, just so you get the reaction, because perhaps it is true, as pointed out recently, that it is a protein poison that causes leukocytosis and that the only virtue vaccines possess is that of stimulation to leukocytosis. I was very much interested in the changes in morphology in the gonococcus when treated with various solutions. We have noticed the same occurrence in our own work. For two years or more we have been experimenting in a comparatively large number of cases with heated sounds treatment of gonorrhea. In the hands of a man who will make a diagnosis and locate the disease this treatment is of immense value, especially in the acute cases and even in the chronic cases. Many cases of chronic prostatitis and seminal vesiculitis, when treated through the rectum through a suitable rubber bag heated by water running through it at 135 degrees, are favorably influenced. It was after these treatments that we noted the morphologic changes Dr. Warden mentioned.

Dr. Edwin Beer, New York: The remark made by the last speaker and the previous speaker should be challenged, that if there is a reaction possibly we get good results. With a very varied experience not only in genito-urinary but in

general surgery, treating staphylococcus, streptococcus, gonococcus, tuberculous and other infections, I have come to the conclusion which Dr. Schmidt expressed that there is nothing absolutely reliable in the vaccine treatment. During the last year and a half we have been following a series of cases, mostly genito-urinary cases due to tuberculosis, with the Rosenbach tuberculin, which has been very much vaunted abroad and which is a vaccine treatment, and the general conclusion which we have reached in treating fistula after nephrectomies and due to tuberculous epididymitis is that the Rosenbach tuberculin is of practically no value. The second vaccine with which we worked was the Nicolle vaccine for gonococcus infections, and although once in a while we saw remarkable results, the totality of results were no better than from any other treatment. So in general I would say that Nicolle vaccine has not been satisfactory. When it comes to treating cases with colon vaccine I think everybody is reminded that there may be something in the treatment, although experience, on the whole, is opposed to the view that it is specific.. For instance, take pyelonephritis due to the colon bacillus. All of us have treated protracted cases with high temperature with vaccine, and every once in a while we see a remarkable result, but when that result is exceptional, when it does not follow with regularity in colon pyelonephritis cases, both in the acute and chronic stages, one cannot help but doubt that the success in one case was accidental rather than the result of the vaccine treatment. So that I would be inclined to go on record in stating that up to date, the results from vaccines have been very unsatisfactory. I am now beginning to treat a series of cases with sensitized vaccines following Beredka, but owing to the difficulty in procuring autogenous sensitized vaccines, we are compelled to make use of the stock preparations prepared by Mulford.

DR. W. JONES WALLACE, Oklahoma City: I have used vaccines a good deal, and to my mind they should be used in selected cases or in complications. In acute cases I never use them, but when it comes to the chronic cases or when there is an epididymitis or an arthritis or some other complication, vaccines can be used with advantage. The great trouble is that we do not use vaccine in large enough doses. I often use a stock vaccine, but I do not follow the directions given in the circulars. I repeat the dose each succeeding day until I get some reaction.

DR. MARTIN KROTOSZYNER, San Francisco: The efficacy of vaccine therapy, which is undoubtedly an important addition to our armamentarium against gonorrhea, is jeopardized by its frequent uncritical application in the past. Like other therapeutic measures, vaccine therapy was in the beginning of its use praised to the skies, and is of late, because it has not yielded the expected results, meeting with a great deal of adverse and unmerited criticism, which more justly should be applied to the unscientific use of this therapeutic agent. The indiscriminate use of stock vaccines for all forms and stages of gonorrhea should be discouraged. It is well known that the various vaccine strains of the gonococcus differ widely in endotoxins and that it is, therefore, impossible to bring into one vaccine all strains required for the formation of antibodies. Thus divergent results in vaccine-reactions and therapeutic efficacy in apparently identical clinical lesions find their explanation. The solution of the problem in getting more uniform results is dependent, in my opinion, on the application of carefully prepared autogenous vaccines. Vaccine therapy, under these conditions, should always be conducted clinically, and good results may be expected by carefully conducted vaccine therapy at hospitals, equipped with scientific laboratory facilities for these purposes.

DR. E. G. CRABTREE, Boston: I cannot leave unemphasized one point that Dr. Warden has brought out which I think is probably the key to vaccine treatment. We have been accustomed to give vaccines without carefully studying bacterial life in the way that Dr. Warden has studied the gonococcus.

It is undoubtedly true that most bacteria in their acute stage produce antibodies which persist for varying lengths of time, the exact duration of which we do not know, and in many cases we are not concerned with it. Bacteria which are quiescent or which occupy some remote part of the body apparently do not produce antibodies, but diagnoses are made because of that antibody production which occurred during the acute infection. It has already been established by clinical use of vaccines that recurrences are often prevented, and in the great majority of cases symptoms relieved. That is particularly borne out in the vaccine treatment of colon pyelonephritis. You can feel sure that recurrence will not take place. As a curative agent, however, the colon vaccine has proved a failure. We have nothing to indicate that the products elaborated in the blood reach the urine as such, and unless the process is acute our vaccine treatment is probably not effective. Undoubtedly a more careful study of the cell content of the various bacteria and a more careful study of blood manifestations, particularly in the acute stage of infection, will lead us to a better working basis in vaccine therapy.

DR. VICTOR G. VECKI, San Francisco: While I have more than one patient who swears by me because I cured him with autogenous and other vaccines, I must say that I have abandoned this treatment. I have come back to the conclusion I cited several years ago that the results obtained in vaccine and serum treatment are probably due to the circumstance that the urethra having previously been overtreated is under the vaccine treatment given some rest at the expense of the patient's "hide."

DR. LOUIS E. SCHMIDT, Chicago: I had reference chiefly to gonorrhea and its treatment with vaccines and serums made from the gonococcus. I do not doubt that there are many cases that have been improved and possibly cured by the various vaccines and serums and combinations that have been used. The question is whether or not it is by specific antibodies. There has been an enormous amount of work done in connection with the injection of so-called harmless remedies or agents, for instance, milk. Milk is being injected in 5 or 10 c.c. doses into the glutei, and exactly the same reactions occur and the same astounding results have been shown. Now, how is the result obtained? Sometimes there is a high rise of temperature, and then possibly by-products have been produced by injecting these agents. Whether or not they are specific, that is the question. For that reason, I am still in doubt as to whether it is necessary, or whether the agents that have been produced in the gonococcus are absolutely essential. For that reason I am inclined to believe that some of the artificial products that Dr. Warden has taken up will probably prove as successful, if not more so, than those that have been in use up to the present time.

DR. CARL C. WARDEN, Ann Arbor, Mich.: One further word about these fat antigens and how they work. If we were to regard the gonococcus alone, from which a fatty antigen has been obtained for complement fixation, it would require considerable temerity to assign all antigenic properties to fats alone, but only lately we have been able to do the same thing with the Wassermann, that is, we have made an artificial fat antigen that concurs with two other antigens which have been standardized and which agree among themselves. Many substances of a fatty nature put into a solution will immediately lower the surface tension of that fluid a great deal, and any substance that lowers tension is bound to appear at the interface between two systems and these fats are found at the interfaces of the substances composing the solution. In consequence, they must act in some such way in complement fixation in order to allow or prevent the hemolysis. The ideas as to antibodies will gradually undergo a change and we may come to view the antibody not as a definite substance, but rather as a condition or a state of the body fluids. Recent experiments have shown that normal serum removed from the body becomes toxic under certain conditions. Its toxicity will wear off in a short time, and it will undergo fluctuations of toxicity and nontoxicity. During the toxic stage the complement disappears. Whether that is a definite substance we are beginning to doubt. It looks as though the complement itself might be a highly dispersed state or condition in the serum itself or in the body fluids. We know that in living tissues in health fat is not commonly seen in the cells, but once a foreign substance like a fat solvent is applied, some of these cells will show fat globules. These cells do not contain any more fat than they did before, but the colloidal state has undergone such a change that the fat globules have been allowed to coalesce. So I think that in some of these forms of disease caused by the *Coccaceae* we will come to believe that the antibody itself

is a very slight factor, that more depends on the state of the body fluids or the state of the serum, and that certain conditions may arise where the germs can exist no longer, and other conditions may exist where the germs may be able to multiply and grow. I believe the time is coming soon when we shall be able to cure an attack of gonorrhea, but it will have to be done only by careful study of the condition or state of the body fluids of the patient at the time. I believe there is a relationship between this complement fixation and the state of the blood whereby the life of the gonococcus is extremely precarious, and that we shall be able by some means, possibly by these fat remedies which I have suggested, to shift the balance of the surface tension just sufficient to cause the death of the coccus forms that are there. It will not produce an immunity; it will not be fool proof under any circumstances, but it will probably be sufficient. It will not be able to dispose of all the gonococci that can exist in a saprophytic condition on the mucous membrane, but it will kill the gonococci inside the cells or tissues. As Dr. Crabtree says in relation to the colon bacillus, the vaccine will relieve the inflammation in colon bacillus infections, but it will not get rid of the colon bacillus.

SPASMODIC ASTHMA

REPORT OF CASES ILLUSTRATING ITS ANAPHYLACTIC NATURE AND THE DIFFICULTIES IN THE WAY OF SUCCESSFUL TREATMENT

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In a previous paper,[1] special consideration was given to the nature and treatment of bronchial asthma. Since then a number of cases have been treated in accordance with the views therein set down, and a good many inquiries have been received relative to the subject; therefore I have decided to make the following reports in the hope of assisting other workers in the solution of the problems confronting them.

With increased experience, the conviction expressed in the paper referred to has been strengthened, and in particular it has been demonstrated that no pains must be spared in searching for and removing every diseased process which may serve as a focus for protein absorption. Furthermore, in many cases more than one such focus exists, and it would seem as if sensitization to protein from one source renders the individual peculiarly liable to sensitization to other proteins and to proteins absorbed from different situations within his body. This is especially well shown in persons suffering from so-called hay-fever or hay-asthma. And here it may be stated that, with one exception, the cases herein reported are instances of typical spasmodic asthma independent of the summer and autumnal disease generally caused by sensitization to some plant or animal protein. The foreign protein at work was furnished within their own bodies, and not from sources situated without their own economy.

As will be seen, the focus or foci may generally be found in the nares or accessory parts, as ethmoid or sinuses, but diseased tonsils and suppurative processes about the gums or tooth roots may prove a very fruitful source of mischief. In cases of long standing with frequent repetition of asthmatic seizures, chronic bronchitis often supervenes and then may furnish the bacterial protein after all other foci have been removed by operation. That a focus of infection outside the respiratory tract may be responsible for the asthma is quite possible, as was shown by the case mentioned in my previous article of freedom from asthma so long as the infected gallbladder was permitted to drain freely, and of return of the paroxysmal dyspnea when drainage ceased.

It should be stated, moreover, that further acquaintance with this class of sufferers suggests that some additional factor as yet unsolved may underlie or be associated with their sensitization to a foreign protein. That spasmodic asthma is not a nervous affection, as assumed by early writers, and, indeed, is not due to the effect of the poison on the central nervous system is proved by the occurrence of the phenomena even after all connection between the bronchioles and spinal cord was destroyed in the guinea-pigs experimented on by Auer and Lewis. Nevertheless, one cannot see much of these sufferers without getting the impression that some sort of connection does exist between the asthmatic condition and the nervous make-up of the individual. Whether there is some peculiarity or susceptibility of bronchial muscles predisposing certain persons to this particular manifestation of anaphylaxis, or whether the instability of the nervous system seen in them is a result or effect of the asthma is difficult to determine. Certainly the question is suggested, Why do some persons manifest asthma when others with an identical focus of infection and the same organisms in cultures from the material of the foci do not show asthma? Dogs and guinea-pigs react differently to the same protein, but these animals are of different species. What, then, is it in human animals of the same species which causes a different reaction to apparently the same protein? It would seem as if some additional and as yet unknown factor still has to be discovered.

CASE 1.—Mrs. N. H. B., aged 55, was seen, Sept. 1, 1914, because of severe attacks of spasmodic dyspnea from which she had suffered for the better part of a year. The family history was negative, and the personal facts, briefly stated, were tonsillitis and appendicitis ten years before, and in September, 1913, an acute coryza which at length resulted in bronchitis for which she spent the winter in the South. Returning North in the early spring she became so much worse en route as to necessitate stopping in Atlanta, Ga., for medical care. When the patient recovered from the illness, which, as seems likely, was a bronchopneumonia, her dyspnea took on the character of typical spasmodic asthma. After spending the following summer in Colorado under competent medical care without benefit, she returned to her Chicago home and consulted me.

It was learned that she had for months been having recurrences of spasmodic dyspnea quite regularly every four hours which yielded only imperfectly to subcutaneous injections of a solution of epinephrin, from 4 to 8 minims of a 1:1,000 solution. She also thought she obtained slight relief from her difficult, harassing cough from 4-grain doses of potassium iodid three times daily. Examination of the chest disclosed hyperresonance with characteristic prolongation of expiration and copious sibilant rhonchi. In the left lower back, however, was a small area in which slight dulness could be detected and medium sized mucous râles could be heard, signs thought to have resulted from the patient's acute illness in Atlanta. The heart was negative in all respects, as were blood pressure, temperature, blood count and urine. A competent rhinologist and laryngologist reported the nose and throat free from any abnormality responsible for the asthma. Films were then made of the teeth and disclosed a small alveolar abscess for the cure of which one tooth was extracted, but without appreciable effect on the asthma. A roentgenogram of the lungs revealed what appeared to be a small area of thickening in the posterior base of the left lung where it was thought a patch of bronchopneumonia had existed.

1. Babcock, R. H.: The Nature and Treatment of Bronchial Asthma, THE JOURNAL A. M. A., June 26, 1915, p. 2115.

During the two weeks required for this study of the case, asthmatic paroxysms were of daily and nightly occurrence, necessitating frequent resort to epinephrin. A vaccine was now prepared from the sputum, and consisted of *Micrococcus catarrhalis* and was administered carefully with appreciable lessening of the bronchitis, though slight influence over the asthma. A week later culture of the sputum yielded *M. catarrhalis* but in addition the pneumococcus, an anaerobic fusiform bacillus and *Streptococcus viridans*. A second vaccine was therefore prepared and carefully administered until toward the end of October. Some improvement was shown for a time, but a relapse occurring, a third vaccine was made, since now the culture from sputum yielded a preponderating number of the fusiform bacillus. In November, asthma was less frequent, but cough was more troublesome with less stringy, more fluid mucus.

The course of the disease was henceforth most checkered with periods of improvement interspersed with others of aggravated dyspnea, more troublesome cough, and an increased number of wheezing and mucous râles, so that not only were repeated changes made in the vaccines, but also recourse was had to various expectorant remedies, including aspidospermin, which seemed to afford the greatest relief. In March, 1915, after a short period of encouraging improvement, the patient contracted a sharp rise of temperature with greatly aggravated cough and dyspnea, though not of the paroxysmal type previously observed. At this time, culture of the sputum showed typical pneumococcus and practical disappearance of the organisms previously obtained. Nevertheless, with subsidence of temperature and disappearance of pneumococci the asthma recurred in full force. At length in the summer of 1915 the asthmatic condition mended appreciably, and we were all encouraged, only again to be disappointed by return of the asthma in full vigor by September. During all these months everything had been done that could be devised with no greater result than to rid the lungs of most of the bronchitis save in the left lower back, where evidently some permanent change in lung structure had taken place.

At times when this patient's asthmatic symptoms were least apparent a frequent racking cough still persisted and caused considerable feeling of stuffiness, as she expressed it. Finally in October she decided to change physicians, and I was dismissed. What afterward was done is known only through hearsay; but it is known that a number of new vaccines were prepared and administered without, however, entirely relieving the asthma. Finally, completely discouraged, this poor sufferer ended it all by voluntary and tragic death.

CASE 2.—Mrs. D., aged 44, seen March 23, 1915, had suffered from bronchial asthma since the early fall preceding. She was found to have small but diseased tonsils, an alveolar abscess, chronic bronchitis and a pyosalpinx. The alveolar abscess was removed by extraction of the diseased teeth, and anaerobic and aerobic cultures of the pus on blood agar and ascitic bouillon showed *Streptococcus mucosus* and pneumococcus-like diplococcus. From this pus no vaccine was prepared, as the evacuation of the abscess cavity was thought sufficient to remove protein absorption from that focus. As the patient had chronic bronchitis with sputum, a culture of this was next made, after careful washing, and it showed anaerobically and aerobically *Micrococcus catarrhalis, Diplococcus mucosus*, and a very few influenza-like bacilli. Owing to the absence of fusiform bacilli, no vaccine was prepared until toward the end of April, when a few anaerobic fusiform bacilli were found in addition to *Micrococcus catarrhalis* and *Diplococcus mucosus*. In June another vaccine was prepared of the same organisms, except that the fusiform bacilli were more numerous. On regular, cautious employment of this vaccine, together with a cough mixture containing lobelia, improvement proceeded gradually, though not uninterruptedly, until by July she declared herself free from asthma.

In October following she contracted a coryza coincidently with menstruation, and soon thereafter experienced a recurrence of her old enemy in severe form. Completely discouraged she not long afterward left Chicago, and has been heard from but once since, when severe asthma was reported. During her asthma-free interval, the tonsils were extirpated, but despite the advice to have the pyosalpinx removed, this was not done. How much influence could be attached to this focus of infection could not be determined, but it was considered a mistake to leave it unoperated, especially as it was uncertain whether the relapse in October was due to the coryza or to absorption from the pyosalpinx coincident with the appearance of the menses.

CASE 3.—Mrs. B., aged 29, examined Aug. 11, 1915, had suffered from asthma since the age of 6. She was found to have chronic ethmoiditis with polypi, badly infected tonsils, and alveolar abscess with chronic bronchitis. Culture of the pus from the jaw showed no fusiform bacilli, but *Diplococcus mucosus, Streptococcus viridans*, staphylococcus and the diphtheroid bacillus. No vaccine was prepared because of the belief that the anaerobic fusiform bacillus is the organism having most influence over the asthma, and that without it vaccines would be inert. In addition to extraction of the diseased teeth, a tonsillectomy and removal of the nasal polyps, as much work was done on the ethmoid as was possible at the time. August 16, a vaccine was prepared from the tenacious, slightly purulent sputum, and contained a large number of the fusiform bacillus.

After completion of all the operative work, the patient returned home and continued the use of the autogenous vaccine until December, when another specimen of sputum showed on culture the fusiform bacillus as well as several other organisms. Treatment was continued along the same line during the succeeding winter, but without as decided improvement as was hoped. At length, early in the past summer this patient reappeared in Chicago in consequence of exacerbation of her asthma, although it was not so distressing as a year previous. Examination disclosed retention of nasal secretion in consequence of a hypertrophied turbinate, and in addition considerable bronchitis. Proper treatment of the nose was at once instituted, and a vaccine was prepared from the sputum, the culture showing as before the anaerobic fusiform bacillus. At present writing, August 24, she is receiving this vaccine and is fairly comfortable, though not wholly free from some asthmatic stuffiness.

CASE 4.—Mrs. S., aged 32, sought advice, Feb. 17, 1915, because of asthma. There was a history of appendicitis fifteen years before, and a curettage two years ago, but no other definite illnesses. She was found to have chronic ethmoiditis with polypi, pyorrhea, diseased tooth roots and extensive bronchitis in both lungs. There was also a systolic murmur in both mitral and tricuspid areas. The nasal and mouth conditions required much operative work, and this being impossible for financial and other reasons, among the latter being daily asthmatic seizures, treatment dragged along for many months. Meanwhile attempts were made to lessen the bronchitis and cough by means of various expectorant and sedative remedies as well as by vaccines made from the sputum. This in June, 1915, contained *Micrococcus catarrhalis* and *Diplococcus mucosus*. July 25, 10 minims of this vaccine were followed by severe reaction, fever, increased cough and asthma. August 7, the patient reported the extraction of some of the teeth, and was feeling somewhat better. August 30, the asthma was less and a slight gain in weight was recorded. September 8, more asthma was reported after the last injection, but the lungs yielded no râles except in the lower right back. September 15, a second vaccine made from sputum contained *Micrococcus catarrhalis, Diplococcus mucosus*, staphylococcus and a few fusiform bacilli. From this date my records are wanting, as the patient has not come at all regularly for the vaccine injection. She has submitted from time to time to palliative but not radical operations on the nose, since her reduced physical state was such that the rhinologist dared not subject her to any severe operative procedure. She is, therefore, after eighteen months still suffering from her old enemy. It is considered unfortunate that this patient's circumstances have not permitted prolonged hospital treatment with a view to establishing sufficient resistance to enable her to bear whatever operations might be necessary to remove all foci of infection in the ethmoid and elsewhere.

Case 5.—Mr. L., attorney, aged 41, examined July 19, 1915, had suffered from asthmatic attacks since May, 1914, the seizures being most frequent at night. Family history was negative, but in personal anamnesis there were frequent attacks of grip, an appendicectomy a year before, and alcohol to excess some years earlier. Careful physical examination disclosed no disease of the heart, kidneys and other viscera, but a few fine mucous râles in the lower back on both sides. The turbinates were fairly large and the septum posteriorly was deflected to the left, but these conditions did not interfere with free drainage. The tonsils were large, submerged and showed open crypts without retained secretions. The gums and teeth appeared to be in good condition, but as the leukocytes numbered 13,200, roentgenograms of the teeth were made, which disclosed two abscesses at the roots of the right upper bicuspid and adjacent incisor. These two teeth were extracted and the abscesses were cleaned out. Ten days later cultures of the sputum were made and disclosed *Diplococcus mucosus*, an influenza-like bacillus, and the fusiform bacillus. A vaccine was prepared and administered for a month, at which time the asthma had vanished, although cough and a few râles still persisted. Thereupon, August 25, another culture of the sputum was made and a vaccine was prepared which now contained *Diplococcus mucosus*, 40 per cent., *Micrococcus catarrhalis*, 50 per cent., and a small number of the streptothrix and bacillus mucosus capsulatus. This second vaccine caused prompt disappearance of all signs of bronchitis, and by the first of September the patient felt so well that he insisted on returning to his home to take part in a stormy political campaign. Consent was accorded, provided he would take along the vaccine and have it administered, but as the sequel showed this was a mistake. Either because of the reaction following a too large dose of the vaccine, or because of his strenuous duties, his asthma soon reappeared and necessitated recourse to epinephrin. Nevertheless in a letter just received he states that with exception of the three attacks which occurred soon after his return to his home, he has experienced no paroxysms, but that after lying down in bed at night he sometimes notices a little wheezing. On the whole, however, he considers himself well, but is not certain whether this is due to the treatment received in Chicago or whether, as assured by some of his medical friends, he would in time have grown out of the asthma at home. In my opinion, formed from observation of asthma cases, he would still be suffering with unabated intensity, had he not got rid of his mouth and bronchial foci of infection. This reflection leads to the conjecture that the wheezing still noticed by this patient may find its explanation in the fact of some persisting bronchitis which the vaccine did not wholly clear up.

Case 6.—Miss L., aged 48, examined Oct. 7, 1915, had suffered from nightly attacks of asthma for a year and a half, although her initial seizure occurred four years before, after what she called a cold. She was found to have badly diseased tonsils, and abscesses at the roots of three teeth. There was no evidence of chronic bronchitis. The tonsils were removed, the diseased teeth extracted, and a vaccine prepared from the pus of the alveolar abscess. This vaccine contained a variety of organisms, and among these the fusiform bacillus. She has been seen within the past few weeks, August, 1916, and declares she has had no asthma since recovering from the tonsillectomy. She thinks the vaccine was not necessary, although it was employed for a few weeks.

Case 7.—Mrs. B. L., aged 36, had suffered from asthma since early childhood, but had not developed secondary bronchitis. She was first seen by me in 1900, at which time she was having hemoptysis believed to be due to left apex tuberculosis. From this she recovered, but since then has suffered from her asthma frequently, especially in bad, foggy weather. She had chronic ethmoiditis, a sinus infection and infected tonsils. The nasal and sinus disease was treated from time to time, but not radically until last spring, at which time the tonsils also were removed. She was entirely free from asthma until the onset of hay-fever toward the end of August, 1916. As it is, her dyspnea lacks the intense paroxysmal character of true bronchial asthma, but necessitates recourse to injections of epinephrin.

Case 8.—A man, aged 22, who is now undergoing treatment, has been greatly relieved, although he still declares he is not wholly free. He had suffered from asthma since childhood, and showed signs of chronic bronchitis in addition to a greatly deflected septum at its posterior part which completely prevented free drainage. This condition was fully corrected by a difficult but successful operation, and he now is receiving a vaccine prepared from his sputum and containing the anaerobic fusiform bacillus among other frequently associated organisms. As this patient still resorts to some drug—morphin or cocain—his statements are considered unreliable as to the intensity of his nocturnal dyspnea and the necessity of resorting to his drug and his asthma powders.

CONCLUSIONS

1. As illustrated by Case 1, it is believed that cases of bronchial asthma exhibiting evidence of secondary bronchitis with perhaps areas of atelectasis or bronchiectasis are the ones most refractory to treatment.

2. If no secondary focus of infection exists in the lungs, the discovery and radical removal of foci elsewhere is likely to relieve the patient.

3. If the focus responsible for the protein absorption was in the upper respiratory tract, a coryza or any other condition which occludes the nasal passages and prevents drainage of secretions may occasion a return of asthma, since the individuals are hypersensitive to foreign proteins.

4. Autogenous vaccines prepared from the sputum are of much aid in management, but are a two edged sword, and must be employed with great care, and the patient should be given to understand that treatment will be long and perhaps uncertain.

5. Vaccines can do no good so long as some other focus of infection than that in the lungs is left unremoved by operation.

6. The anaerobic fusiform bacillus has seemed to be the bacterium which exerts special influence in the production of asthma, but this is merely an impression, since only when this organism has been obtained from the sputum and incorporated in the vaccine has the administration of a vaccine been beneficial.

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REFLEX RETENTION OF URINE*

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That the muscles of the bladder may be acted on reflexly so as to prevent the normal act of urination is a common observation. This occurs particularly after gynecologic operations, and after operations on the rectum, anus, testicle and even more remote regions. That the explanation of some of these retentions is not a reflex nerve action but an actual injury to the nervous mechanism, or the urethra or bladder wall is an undoubted fact.

Stoeckel and Ruge,[1] in studying puerperal ischuria, almost invariably found an edematous ring about the internal sphincter. Steuernagel[2] thought that some of the cases of retention of urine following labor were due to an increased bladder capacity. Thus he found that while the normal bladder would hold only between 450 and 550 c.c., the puerperal one could be made to con-

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1. Stoeckel and Ruge: Zystoskopie des Gynäkologen, 1904.
2. Steuernagel: Ztschr. f. Gynäk., Urol., 3, 295.

tain under pressure as much as from 1,500 to 2,500 c.c. And Taussig,[3] in a study of the bladder function after confinement and gynecologic operations, came to the conclusion that the important features in postoperative urinary retention are interference with the blood supply of the bladder; direct or indirect pressure around the sphincter urethrae; excision of the nerve supply of the bladder, and interference with the control of the central nervous system through anesthetics, drugs or mental processes.

All of these factors undoubtedly play a part in postoperative retentions of urine, but aside from these cases there is a group of acute retentions which are undoubtedly dependent on reflex phenomena. Inasmuch as the large majority of these cases are transitory, very little attention has been given to them, and it is true that most of the cases of urinary retention demanding treatment on account of retention are undoubtedly due to a real mechanical obstruction or to a definite organic nerve disease.

In looking over the literature many of the cases of obscure retention were found to give a history of syphilis. It is now a well recognized fact that spinal syphilis may manifest itself in the early stages only by vesical disturbances, and it is probable that many of the formerly obscure cases of retention of urine were really early cases of cerebrospinal syphilis.

Excluding all of these types of chronic retentions, however, there is still another type which I have chosen for the subject of this paper, and that is, a condition of recurrent attacks of retention with at first intervals of entire freedom from vesical disturbances which are dependent on chronic irritation acting in a reflex manner. It is believed that such cases exist without the presence of mechanical obstruction in the sense of an occluding obstruction, without demonstrable nerve lesions and whose mechanism is essentially the same as is seen so commonly following surgical procedures on the nearby structures to the bladder, and that the condition is primarily not necessarily dependent on pathologic changes in the sphincter muscle of the bladder, but is excited reflexly through the spinal cord center.

The experiments of Roussy and Rossi[4] have conclusively demonstrated that the center presiding over the bladder function is situated in the conus terminalis. They showed that destruction of the conus terminalis resulted in complete loss of sphincter control and bladder function, and that section of the spinal cord above the conus terminalis did not destroy the bladder function, inasmuch as animals in which this had been done very quickly resumed control of the urine so that urine was retained in the bladder for definite intervals and expelled in a normal manner. In the adult man this lower spinal center is presided over by the cerebral one so that the act of urination is initiated by a mental process.

Retention of urine, or inability to urinate, depending on disturbances of the cerebral control of urination, are very common, and such must be the explanation of the cases of inability to urinate in the presence of another person or in one situation or another.

Of these disturbances of urination dependent on the cerebral control there are perhaps many different types, some of which are of the same origin as hysteria, as manifested in other ways, a dissociation; others are only temporary inabilities to carry out the mental process to initiate the urinary act.

Frankl-Hochwart[5] mentions an interesting case of the hysterical type in a woman, aged 19, whom for a year and a half it was necessary to catheterize in a hospital, on account of constant retention of urine. Examination showed a completely normal condition. Finally one of the attendants remarked that an operation would have to be performed, and she immediately recovered.

Aldrich[6] has mentioned numerous cases of disturbances of urination dependent on derangements of the higher urinary center. In one instance, a physician was never able to urinate in the presence of another person. In another instance, the person could not use a public urinal. One person could not urinate in a darkened room. One could not urinate unless in a darkened room. A child found it necessary to count in order to urinate, and so on indefinitely.

It is evident that these are not retentions dependent on reflex phenomena acting through the lower urinary center. These are truly cases for psychic suggestion, and it matters little whether this suggestion be carried out by local treatments in the region of the bladder or by well recognized treatments for various hysterical conditions, so long as this group of cases of retention of urine is recognized and is definitely treated as such.

The conception of a reflex chronic retention of urine excited by some external irritant is by no means a new one. Thus Eugene Fuller,[7] in writing on chronic contraction of the vesical neck, speaks of acute spasms of the vesical sphincter excited by pathologic states in the sexual apparatus, the rectum, etc. He believes that these acute spasms might become a condition of chronic contraction as a result of some settled disorder of the sexual apparatus or adjoining structures where this reflex spasm had existed as a prominent symptom for a long period of time. He found, as he believed, evidences in his cases of a preexisting reflex cause, and likened a chronic contraction of the vesical neck to a chronic torticollis.

Swinburne[8] has reported cases of chronic retention of urine which he attributed to a diseased condition of the verumontanum, and thought that the cases of chronic retention which he had studied were closely associated with the cases of acute retention which one sees in acute posterior urethritis.

Other cases of retention attributed to irritations in the posterior urethra have been mentioned by Rothschild,[9] Cohn[10] and others.

Emodi[11] mentions the case of a man in whom the expulsion of a lumbricoid worm stopped the retention crises, and although the neurologic examination in this case was negative, it is open to question, inasmuch as this patient had previously had syphilis.

Reflex spasm with the retention of urine have been attributed to congenital anomalies, phimosis, atresia of the meatus, strictures, foreign bodies, prolonged dilatation of the bladder, inflammation of the kidney (but these may be secondary to cystitis), cystitis, chronic prostatitis, chronic seminal vesiculitis, etc.

3. **Taussig: Surg., Gynec. and Obst., 21, 416.**
4. **Roussy and Rossi: Troubles de la micturition et de la défécation consécutifs aux lesions expérimentales du cone terminal ou de la queue du cheval, Compt. rend., Cong. internat. de med., Budapest (1909) 1910, Section XI, neuropatologie, p. 438.**
5. Frankl-Hochwart, quoted by Cohn, J.: Ueber nervöse Retentio Urinae, Berl. klin. Wchnschr., 1915, **52**, 208.
6. Aldrich, C. J.: Am. Med., 1903, **5**, 489.
7. Fuller, Eugene: Am. Jour. Med. Sc., **104**, 440.
8. Swinburne: Am. Jour. Urol., June, 1910.
9. Rothschild: Ueber Retention ohne Localhinderniss, Cong. Assn. internat. d'urol., Paris, 1908, **1**, 350.
10. Cohn: Footnote 5.
11. Emodi: Ueber einen seltenen Fall von reflectorischer Harnverhaltung, Pester med.-chir. Presse, 1904, **40**, 1029.

REPORT OF CASES

The following cases are reported as examples of reflex retention of urine:

Case 1.—A woman, married, aged 48, was referred to me for urologic examination by Dr. William Monroe Lewis of Los Angeles, Aug. 12, 1914. She complained of being unable to urinate. This difficulty in urinating commenced two years previously when she would have a desire to urinate but would have to strain for some time before being able to pass urine, and a fair amount would then be passed. Hot cloths were used to relieve the straining, which seemed to be at the neck of the bladder. These attacks of difficulty in urinating would come off and on and then disappear. This continued for fifteen months, or nine months before she was seen by me, when she had complete retention and had to be catheterized. She was then able to void until three days before admission, when it was again necessary to catheterize her. At the same time she noticed a fulness in the left side of the abdomen. My examination showed a colon bacillus infection of the urine, a marked acute cystitis, no mechanical obstruction at the neck of the bladder, no trabeculation of the bladder, a complete duplication of the left renal pelvis and ureter, with an infected hydronephrotic sac at the caudal pole. This entire left kidney mass was removed by Dr. Lewis two days later. Following the removal of this sac the patient did not immediately regain the power to urinate, but had to be catheterized for about two weeks, when all retention disappeared entirely and she has been voiding in a normal manner ever since, which has been almost two years. In this case it is evident that the retention of urine was directly associated with the hydronephrotic sac, although it is difficult to say as to what part the inflammation of the bladder might have played in bringing about the retention. In either case the retention was of a reflex origin.

Case 2.—A man, aged 40, extremely well nourished, was first seen by me, July 17, 1915, complaining of spasms at the neck of the bladder, attacks of great difficulty in passing urine, and occasionally having to be catheterized. When 19 years of age he had had gonorrhea complicated by a double epididymitis, and since then two attacks of urethritis at the ages of 27 and 35 years, respectively. The latter two attacks of urethritis followed periods of drinking, lasted for only about ten days, and no gonococci were found in the discharge. The patient denied syphilis. The urinary stream, except when he had periods of retention, was of good size and force. Ejaculation was somewhat premature; the sexual power otherwise was negative. The present illness began about four years previous to admission, when he felt as if he wanted to void but could not until his bowels had moved, at which time he voided freely. At the same time he noticed that on arising in the morning he frequently had a sharp pain running from the prostate to the head of the penis. This pain was relieved by urination. These attacks of pain were accompanied by marked frequency of urination, but it was often necessary for him to go to stool in order to pass urine. There was marked hesitancy, but after the attacks passed off the stream would be of normal size and force. About four months later he had an attack of acute retention and had to be catheterized. He was diagnosed at this time as having a urethral stricture and later as having contracture of the vesical neck. A punch operation was done, but this did not help him. The patient then took a complete rest at one of the springs, and had no bladder disturbances whatever for several months. When first seen by me he had complete retention, but the bladder was not markedly distended. He complained of violent pain at the neck of the bladder, a spasm, as he himself called it. Hot tubs did not relieve him. A catheter was somewhat difficult to pass through the internal sphincter, which was definitely in a spasm. About 300 c.c. of urine were withdrawn. It was then necessary to catheterize him three times within the next twenty-four hours, although there were urinations in which he passed urine with perfect freedom. The urine was negative.

Briefly, then, the history of this case is one of attacks of complete retention occurring in a healthy man, aged 40, associated with spasmodic pain at the neck of the bladder, radiating to the head of the penis. In the intervals between the spasmodic attacks of pain, urination would be perfectly normal, and there would be months of entire freedom from any vesical disturbances. Following hard mental work, a sudden complete, spasmodic, painful retention would occur. The Wassermann test of both the blood and spinal fluid was negative. Roentgenoscopy of the vertebral column was negative. Neurologic examination by a competent neurologist was negative. Urologic findings showed prostate of normal size with slight induration of both lobes. The prostate was not enlarged, nor was it smaller than normal when examined by rectum. The right seminal vesicle was indurated and adherent externally. The left seminal vesicle was also indurated. There was a perivesicular induration and an induration extending between the two seminal vesicles. The prostatic secretion showed 10 per cent. pus. On cystoscopic examination, the patient having complete retention, the bladder capacity was difficult to determine. The bladder wall was not trabeculated. The trigon seemed hypertrophied, the posterior margin quite prominent. There was a slight elevation of the posterior portion of the internal urethral orifice, and a slight rounding of this orifice anteriorly.

The question arose in this as to the possibility of a contracture of the vesical neck. The history is against this. He had not progressively grown worse; in fact, for six months previous to the time when I saw him, he had not had any frequency of urination or any difficulty whatever in passing urine. There would be months of entire freedom from any vesical disturbances, and then following hard work, or things which tended to make him run down, he would have attacks of violent spasm at the neck of the bladder with acute retention. The very next urination would at times be perfectly normal. The spasm of the internal sphincter was so great as to interfere with catheterization. The very violence of the attacks of retention is against a long standing constantly acting mechanical obstruction. It is believed that this is a case not dependent on any definite organic obstruction but on a spasm of the internal sphincter muscle probably reflexly excited by a seminal vesiculitis.

Case 3.—A man, aged 28, married for six years, was first seen by me, March 31, 1915. He complained of periods in which he was unable to urinate, and at these times it was necessary for him to use a catheter. Until the age of 20 he was a healthy man, did not have to get up at night to urinate, and had no difficulty in passing urine. About eight years before admission he started getting up at night to urinate, about once, early in the morning. He was married two years later, and about a year after marriage he commenced to notice burning on urination. Four years before admission he was taken with complete retention and had to be catheterized. He would then have periods in which he would urinate in a normal manner and others in which it would be necessary for him to catheterize himself. In July, 1912, he was studied by a urologist, and in 1913, a suprapubic cystotomy was done. Apparently nothing was found. The bladder was sewed up and quickly healed. For four months then he got along very well, voiding urine without catheterization. He then commenced to have spasmodic pain on voiding. He was again studied and told that the verumontanum was greatly enlarged. This was cauterized with some relief from pain, which seemed to be in that region; but during 1914 it was occasionally necessary for him to catheterize himself, on account of retention of urine. For three weeks previous to admission he used a catheter practically every time the bladder felt full. The history of this catheterization is rather peculiar. At times it was only necessary to pass a catheter a very short distance into the urethra, when he was able to urinate; at others it was necessary to pass the catheter all the way into the bladder, but not necessary to leave it there, for the catheter could sometimes be withdrawn and he would continue to empty the bladder through the urethra with a large size stream.

The course of events in his retention he described as follows: On attempting to urinate, an intense burning at the neck of the bladder occurred, and the muscle then seemed to go into a spasm and shut off the urine. At times some

would be passed, and then the bladder seemed to shut off with a grating sensation, and he was unable to relax it. There was no history of syphilis. He denied gonorrhea. Examination showed a fairly well nourished young man, with normal reflexes. The Wassermann test of the blood and spinal fluid was negative. Roentgenoscopy of the vertebral column was negative. Rectal examination revealed a prostate of about normal size. The prostate showed marked induration along the left outer border, and slight induration of the right lobe. The left seminal vesicle was greatly indurated, and stood out like the finger of a glove. The right seminal vesicle was thickened, but not as much so as the left. The prostatic secretion showed 50 per cent. white blood cells. In spite of the numerous times which the patient had catheterized himself, the urine was not infected and was otherwise negative. Just before cystoscopic examination was done the patient had catheterized himself, and when cystoscopy was performed, 50 c.c. of urine were found in the bladder. The bladder capacity was 160 c.c. The bladder wall was not trabeculated, but the interurereteric band was greatly hypertrophied and stood up as a ridge across the bladder. As the cystoscope was withdrawn into the urethra, no posterior bar was seen, and all of the prostatic views were concave. Anteriorly the scar of the operation spoken of above was seen. The urethra was very carefully studied with an endoscope with negative findings. This patient was treated by prostatic massage and massage of the seminal vesicles. Following this treatment extending over a period of three months he was able to dispense with his catheter, improved greatly in general health, and the spasms at the neck of the bladder ceased. It is thought that this case is an example of a spasmodic retention of urine depending on inflammation of the seminal vesicles. It was cured by attention being given to these diseased organs.

MECHANISM OF RETENTION

What is the mechanism of reflex retention of urine? Is it an inhibition of the detrusor muscle of the bladder, is it a spasm of the sphincter muscles of the bladder, or is it an inability to inhibit the normally contracted sphincter muscle?

In regard to the first possibility, an inhibition of the detrusor muscle of the bladder, Albarran and Nogués[12] have regarded this as the most likely possibility in functional retention of urine extending over a long period of time. While they did not doubt the occurrence of spasms of the muscles occasionally being responsible for the retention of urine, they regarded it as rather unusual. To quote from them:

> We think that the sphincter troubles capable to determine prolonged retention of urine are especially produced when the normal faculty of inhibition, reflex or voluntary, is lost. We also think that most often these disturbances of inhibition have not to do with the sphincter apparatus for their exclusive seat, but that they act also on the contractibility of the bladder.

In this connection the various theories as to the mechanism of cardiospasm are of interest. In this condition there can be no question as to the absence of organic obstruction, and yet the obstruction is most complete.

Morrell Mackenzie[13] believed that it was due to the general weakness of musculature of the esophagus. Mikulicz[14] believed that the spasm of the cardia was responsible for it, and Hertz[15] and Rolleston,[16] from the fact that the muscle at the cardiac orifice is practically never found to be hypertrophied, regarded the condition as due to the inability to relax or inhibit the normally contracted cardiac orifice — an acalasia.

Hertz,[17] however, found one case in which there was a definite spasm at the cardiac sphincter and Mathieu and Roux[18] described a case in which it was impossible to withdraw an esophageal sound until the patient had been anesthetized with chloroform, so that it will be seen that the same views are held in connection with cardiospasm as have been held responsible for functional retention of urine. That the functional retention of urine is not due to an inhibition of the detrusor muscle, as was supposed by Albarran, would seem to be true in the cases which I have cited. When the catheter was passed into the bladder, urine was forced out with considerable force. Moreover, the retention of urine was quite painful and was spasmodic. The condition is not due to a spasm of the external sphincter muscle, nor is this muscle necessarily associated with the retention.

The work of Volcker and Lichtenberg,[19] Leedham-Green,[20] Barringer and MacKee,[21] and Uhl and MacKinney[22] has conclusively demonstrated that urine is retained in the bladder under normal conditions by the internal sphincter muscle. It is commonly supposed that the external sphincter muscle works constantly in unison with the internal sphincter muscle, which is by no means the case. Ejaculation may take place with the bladder full of urine without urine escaping, in which case it is evident that the internal sphincter muscle must be contracted and the external sphincter muscle relaxed. If the prostate be massaged with the bladder full of urine, prostatic secretion can be expressed from the urethra without urine escaping.

In the cases of spasmodic retention of urine cited above, it was definitely determined that the retention took place at the internal sphincter muscle. As to the two remaining possibilities, as to whether this type of retention is due to a spasmodic condition of the internal sphincter or an inability to inhibit a normally contracted muscle, it would seem that both of these conditions might be a possibility; but in the cases which I have observed, some urine would usually be passed, when the muscle would seem to be thrown into a spasm.

TREATMENT

In regard to the treatment of this condition, an attempt should be made to find the exciting cause. In Case 1, the removal of the hydronephrotic sac resulted in a cure of the disturbances of the normal mechanism of urination which had extended over a period of almost two years. In Case 3, massage of the seminal vesicles resulted in a cure, whereas a catheter had been necessary for most of the time over a period of four years. It is a question as to whether this condition could become a settled one and produce permanent changes in the sphincter muscle such as Fuller has described. If this occurs, it is probable that section or division of the internal sphincter muscle would be required for relief of the condition, and in the persistent cases this method of treatment would possibly be advisable.

This condition must be differentiated from contracture of the vesical neck due to fibrous tissue changes.

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13. Mackenzie, Morrell: Diseases of the Throat and Nose, London, 1884, **2**, 115.
14. Mikulicz: Deutsch. med. Wchnschr., 1904, **30**, 17, 50.
15. Hertz: Quart. Jour. Med., **8**, 302.
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18. Mathieu, A., and Roux, J. C.: Pathologie gastro-intestinale, 1909, **1**, 78.
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20. Leedham-Green: Brit. Med. Jour., 1906, **2**, 297.
21. Barringer and MacKee: Radiographs of the Bladder and Bladder Neck, Tr. Am. Urol. Assn., 1912, p. 408.
22. Uhl and MacKinney: Observations upon the Mechanism of Urination, Urol. and Cutan. Rev. (Tech. Sup.), July, 1913.

OBSERVATIONS ON CERTAIN OBSTRUCTIONS AT THE VESICAL ORIFICE *

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The subject of obstructions at the vesical orifice with attendant distressing symptoms has occupied the attention of surgeons for many generations. Interest in this particular field of urology has been much stimulated recently by the fact that cystoscopic examinations have become a routine procedure in cases of patients who are suffering from urinary disturbances.

In urology as in other fields of medical science the progressive surgeon is alert to discover early pathologic conditions in order that relief may be prompt and effective, thereby eliminating much suffering and repairing damaging conditions.

In this discussion it seems advisable to consider vesical orifice obstructions other than those caused by enlargement of the prostate gland proper which is believed to be a subject apart.

The older writers recognized several types of vesical orifice obstructions. Sir E. Home[1] described what we now know to be hypertrophy of the subcervical group of Albarran as the normal middle lobe of the prostate. His view was much and justly criticized by his contemporaries, and in fact the condition was correctly described by writers much before his time. Morgagni[2] in 1761 referred to this condition as a morbid growth causing retention of urine. He considered it to be of the same nature as the prostate gland and contiguous with it. Valsalva, Pohlius, Santorini,[3] Thomas Bartholin of Padua, and Valisneri described similar growths, and were quoted by Morgagni and Bonetus[4] as early as 1700 to the effect that excrescences grew out in the very middle of the internal and upper circumference of the gland, posteriorly, in some old men. Lieutaud, a contemporary of Morgagni, considered an eminence at the neck of the bladder to be not a morbid growth, but a small part quite natural and common to all bodies. He called it the "uvula vesicae." John Hunter[5] agreed with the opinion of Lieutaud. J. Cruveilhier[6] and Langenbeck considered a protuberance in this region to be pathologic and that there was no definite middle lobe but a middle portion.

Fig. 1.—Oblique section through the prostate and trigonal region of a man aged 76: *Ur*, urethra; *AG*, subcervical gland tubules; *VS*, vesical sphincter; *ML*, middle lobe tubules; *EJD*, ejaculatory ducts and muscular envelope; *PL*, posterior lobe tubules; *Lat*, lateral lobe tubules.

Valpeau[7] mentioned fibrous prostatic tumors, "which develop in the direction of the vesical cavity, which become absolutely pedunculated precisely as do the fibrous polypi of the uterus, and become enveloped by the vesical mucous membrane." Rokitansky[8] considered such tumors and their relation to the prostate to be analogous to tumors of the thyroid gland and outlying formations similar in structure to it. Sir J. Paget[9] agreed with this view, as did also Sir W. Fergusson,[10] Mr. Shaw[11] and Sir Henry Thompson.[12]

Mr. J. G. Guthrie in 1830 lectured on prostatic and nonprostatic obstructions at the vesical orifice. He concluded that (1) an elastic structure exists at the neck of the bladder and may be diseased without any necessary connection with the prostate gland; (2) the prostate gland may be diseased without any necessary connection with the elastic structure. Mr. Guthrie first used the term "bar at the neck of the bladder," and distinguished between it and the obstruction caused by the large median portion of the prostate proper. Civiale[13] describes the "vesico-urethral barrier" as formed in some cases by "a simple fold of membrane, smooth and thin, and almost transparent, extending from one lobe of the prostate to the opposite" and others by fold, thicker, in the form of a rounded cord which contains some fibrous or muscular tissue. He also mentions that obstruction in the region of the vesical orifice may be due to spasmodic muscular contractions, rheumatism, etc. Mercier[14] does not entirely agree with the views of Guthrie, but describes a "semiannular eminence." He recognizes two distinct kinds, one produced by repeated spasm of the muscular fibers which close the neck of the bladder, becoming a permanent bar, the other a result of hypertrophy of the median portion of the prostate.

Sir Charles Bell[15] believed that hypertrophy of the middle lobe was caused by the pull exerted on it by the muscle bands of the trigonum vesicae in irritative conditions of the bladder. The work of G. V. Ellis[16] on the anatomy of this region proved that the muscles of the trigon are attached to the longitudinal muscular coat of the urethra and hence do not react in the manner described by Bell.

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* Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints. A copy of the latter will be sent by the author on receipt of a stamped addressed envelope.

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10. Fergusson: Proc. Path. Soc. London, Feb. 19, 1849, p. 83.
11. Shaw: Proc. Path. Soc. London, May 7, 1849, p. 83.
12. Thompson: Tr. Path. Soc., 1855, **7**, 254.
13. Civiale: Traité pratique, **2**, 244.
14. Mercier: Recherches sur le traitement des maladies des organes urinaires, Paris, 1856.
15. Bell: An Account of the Muscles of the Ureters and Their Effects in Irritable States of the Bladder, Tr. Med. and Chir. Soc., 1812, **3**.
16. Ellis: An Account of the Arrangement of the Muscular Substance in the Urinary and Certain of the Generative Organs of the Body, Med.-Chir. Tr., **39**, 327.

Albarran[17] describes in detail a group of glands at the vesical orifice which open into the urethra and whose tubules lie between the mucosa and the musculature. He calls this the subcervical glandular group and states that it varies greatly in different individuals and may be entirely lacking in some. Cuthbert S. Wallace[18] states that in a certain number of cases while circular muscle fiber is still well marked and forming a very definite barrier between the gland tissue behind and the urethra in front, there can be seen lying close under the mucous membrane prostatic glandular alveoli which may give rise to the small adenomatous tumors situated just within the internal meatus in some cases.

Dittel[19] maintains that the hypertrophic middle lobe does not project behind the sphincter into the lumen of the bladder, but originates from the "portia intermedia" in front of the sphincter and encroaches during the growth between the mucous membrane of the urethra and posterior half ring of the sphincter, by which procedure the sphincter comes to lie behind as a tumor functionating like a valve. Jores states that valvelike tumors of the orifice take their origin not from the prostate gland itself, but from the glandular tissue, which is already normally present, "in most individuals above the colliculus seminalis" just below the mucous membrane of the urethra and orificium, respectively, at any rate, in front of the sphincter. Ciechanowski[20] agrees with the view expressed by Jores.

Anatomic conditions at the vesical orifice have been extensively studied by the author.[21] The small group of subcervical tubules which seem to have attracted so many writers has proved to be most interesting. These tubules begin to develop at the fourth intra-uterine month and are found in every specimen older than that. They are not particularly numerous up to the time of birth, as there are never more than eleven. After birth they increase greatly so that in one specimen there are as many as forty-three. The average number for all specimens is twenty-five. Structurally they differ from prostatic tubules in a number of important details. There is not a differentiated layer of muscular and connective tissue fibers around them, although in disease the fibrous tissue develops an encircling sheath in many instances. The mucosa is composed of two or three layers of low columnar or cuboidal epithelial cells, chiefly the latter, placed on a feltlike basement membrane. The nuclei are usually in the center of these cells and almost never occur near their bases as they do in the cylindric cells of prostatic mucosa. Many of these nuclei are oval in contour. The lumina are small and usually circular or oval in shape and rarely have an irregular outline with fingerlike projections as do the prostatic tubules. These tubules in an adult resemble the tubules of an embryonic prostate gland to a considerable degree.

Fig. 2.—Moderate unilobular hypertrophy of subcervical group with a raised contracted trigonum vesicae and a moderately deep baa fond. Bladder shows signs of obstruction.

The subcervical group of tubules located, as its name signifies, at the vesical orifice, chiefly in the mucosa of its floor, is subjected to many influences which tend to make the occurrence of pathologic conditions rather frequent. In fact, a careful study of some 350 prostates collected from routine necropsies shows an enlargement of this group in about 25 per cent. of patients over 30 years of age. In practically all cases of adenomatous hypertrophy of the prostate there is an accompanying enlargement of the subcervical group of considerable degree. Therefore it is assumed that the same factor which causes an adenomatous hypertrophy of the prostate also stimulates an overgrowth of the subcervical group of tubules, and furthermore it is believed that the latter structure responds to this stimulating influence before the prostate itself does.

The enlargement of the subcervical group of tubules occurs in several forms. The most frequent is the small single tumor which occurs in the midline at the vesical orifice and usually projects through the internal meatus into the bladder. This structure was observed by the older writers and apparently occurred with great frequency in 1700, as it was described at that time by the venerable French writer Lieutaud, who considered it a normal structure and called it the "uvula vesicae." Next in frequency of occurrence are the medium sized single tumors. Very many cases of extensive adenomatous hypertrophy of the prostate are accompanied by an intravesical intrusion of the subcervical group of tubules, and this tumor is frequently mistaken for an enlargement of the middle lobe which is, as a matter of fact, usually adenomatous in type but rarely protrudes into the bladder, although it often lifts the lower portion of the trigonum vesicae. In almost every instance careful examination of the adenomatous prostate removed intact shows a groove where the vesical sphincter has compressed the enlarged subcervical group which projects into the bladder, and which is removed with the prostate in the suprapubic operation.

In addition to the single tumors of various sizes there are a number of enlargements of this group which are partially divided. This division seems to be caused by a rather strong development of the bundles of muscle and connective tissue which extend from each ureter to the musculature of the posterior urethra, the so-called "Bell's muscles." These structures in some instances are more unyielding than in others, and hence cause a lack of development at their strongest points, thus dividing partially or completely the group into several parts, usually three. Sometimes the division is so complete that the entire

17. Albarran: Maladies de la prostate, 1902, p. 526.
18. Wallace, Cuthbert S.: Prostatic Enlargement, London, 1907, p. 20.
19. Dittel: Beiträge zur Lehre der Hypertrophie der Prostata, Wien. med. Jahrb., 1867, p. 142.
20. Ciechanowski: Anatomical Researches on the So-Called Prostatic Hypertrophy (translated by Dr. Robert H. Greene), 1903, p. 79.
21. Lowsley, O. S.: Am. Jour. Anat., 1912, **3**, No. 3; The Human Prostate Gland at Birth, THE JOURNAL A. M. A., Jan. 11, 1913, p. 110.

group is composed of three practically pedunculated masses which just exactly fit in the vesical orifice, and on attempted urination are forced into the internal meatus, entirely closing it.

One other type of subcervical tumor occurs, namely, the horseshoe shaped tumor. This type is generally fairly large and usually encompasses the lower half of the circumference of the internal meatus. Obstruction to urination occurs in this type, and may be complete, but is ordinarily partial. The act of micturition in this instance may be and usually is accompanied by considerable pain. In one interesting case in my practice the patient had been operated on for an adenomatous prostate by Young's perineal method, after which his complete retention became partial, there being 12 ounces of residual urine after his micturition, which occurred as a very painful dribbling. Cystoscopic examination showed a horseshoe shaped enlargement of the subcervical group of tubules which was a little more extensive on the left than on the right. The tumor was removed by Young's punch with thorough relief of pain, a good strong stream of urine and less than 1 ounce of residual urine.

Hypertrophic changes in the trigonal musculature come next in frequency as a cause of the obstruction at the vesical orifice to urinary outflow. In a series of cases recently reported, seventeen cases with sufficient hypertrophy to cause considerable obstruction to urinary outflow were found which made up 7.6 per cent. of the entire number observed. This condition almost never occurs before the fortieth year. It is accompanied by a very deep posttrigonal pouch or bas fond.

The subtrigonal group of tubules which is found in all specimens between the middle of the trigonum vesicae and the vesical orifice is frequently the seat of pathologic change. The most frequent lesion is ulceration, but sometimes there are found tumors which are a source of obstruction. These tumors are of three kinds. The most common is the low mound shaped mass which sometimes does and again does not cause obstruction. Rarely if ever does this type not cause complete retention. Next in frequency is the pedunculated mass which is an outgrowth from this group of tubules, and, situated as it is just above the vesical orifice, often acts as a ball valve and may cause complete retention of urine. Dr. Hugh H. Young of Baltimore reports several such cases, and I have observed a number of others through the cystoscope. Villous papillomas occur in this region occasionally and may even be found just at the vesical orifice, as Joseph F. McCarthy has observed.

Fibrous stricture of the vesical orifice is not an infrequent source of obstruction to urinary outflow. This is usually a result of chronic inflammatory process, but may follow operative procedure in this region.

A specimen showing marked stricture of the vesical orifice was sectioned and cut both longitudinally and laterally and stained according to van Gieson's method and also with hematoxylin and eosin. A brief description follows: The mucosa of the apex of the trigonum and the vesical orifice is composed of several layers of epithelial cells transitional in type. The smooth muscle bundles of the trigonum vesicae are well shown as fine fibrils superimposed on the rather coarser bundles forming the vesical wall proper. At the apex of the trigon these muscle bundles seem to be firmly and closely matted together. Numerous blood vessels of moderate size are found throughout this region. They are, in fact, much more numerous here than at any other portion of the structure. Proliferation of the connective tissue cells has taken place, and there is marked small round cell infiltration. This increase in fibrous tissue is most marked in the layer which is continuous with the trigonum vesicae and above and toward the bladder lumen from the subcervical group of tubules. Extending downward from the trigonal region at several points are observed quite marked bundles of tissue which insinuate themselves between the fibers composing the wall of the bladder proper, and these serve to bind the two structures together quite firmly. The subcervical tubules of Albarran are considerably atrophied in appearance. The mucous membrane lining the tubules is composed of cuboidal shaped cells, usually one layer in thickness placed on a feltwork base. There is considerable infiltration of small round cells in the region of these tubules and also about the muscle bundles of the sphincter which lie just beneath them. The entire picture gives one the impression of fibrosis due to long continued low grade inflammation.

Fig. 3.—Enlargement of subcervical group in the shape of a very thick letter U extending from the upper end of the verumontanum within the sphincter and into the bladder, which shows signs of obstruction.

Cysts at the vesical orifice are occasionally met with, and in some instances are the cause of grave obstruction. They usually occur just within the vesical sphincter and probably arise from the subcervical tubules. Rarely, however, they may spring from the subtrigonal group. One which occurred in my series gave rise to very marked obstruction with retention of urine and trabeculation of the fundus of the bladder.

DIAGNOSIS

The diagnosis of the above conditions is based on the following findings: There is often a certain amount of pain, even in the earlier stages. Sometimes it becomes exceedingly acute and in other instances may be merely a feeling of uneasiness when the bladder becomes full or is being emptied. Very often the patient has a feeling that he is not able to completely empty his bladder. In the worst cases the symptoms may resemble those of the prostatic. There is always residual urine. Often in early cases this will not exceed an ounce. In a case of moderate degree it usually amounts to 4 or 5 ounces, and in the more advanced cases complete retention results.

The passage of bougies and sounds reveals to the careful manipulator the fact that stricture is not the cause of the patient's trouble, and just as the instrument passes into the bladder the sense of riding over an obstructive mass at the vesical orifice is transmitted. Catheterization reveals the amount of residual urine.

On rectal examination the prostate will usually be found to show evidence of chronic irritation. It frequently is indurated and nodular, and usually there are numerous bandlike adhesions extending from the lateral surfaces and between the base and the seminal vesicles. These vary in their firmness. The most important thing to be learned from the examination of the prostate in these cases is that it does not show marked enlargement. With an instrument in the urethra and the finger in the rectum changes of the collarlike vesical sphincter are readily appreciated.

Fig. 4.—Trilobe enlargement of subcervical group with marked signs of obstruction.

Cystoscopic examination, preferably with the McCarthy straight instrument or the Buerger urethroscope, is the most important examination to be made in arriving at a diagnosis in these cases. There is usually hypertrophy of the musculature of the bladder wall so that trabeculation in the fundus is quite marked, cellules occurring frequently, sometimes being quite deep.

The trigonum vesicae is in most instances somewhat hypertrophied, particularly in the interureteric region, thus forming a rather deep posttrigonal pouch. The ureteral orifices are situated on quite marked ridges owing to the trigonal hypertrophy and are not necessarily changed, although they may be dilated from back pressure in aggravated cases.

The vesical orifice is of course the most interesting part of the picture. Tumor masses arising from the subtrigonal group are easily recognized, as are those which originate from the subcervical tubules. It is sometimes necessary in the case of the latter to depress the eyepiece of the cystoscope considerably in order to throw the vesical orifice into the field more satisfactorily. Very early tumors on the floor of the internal meatus are recognized by the change from the normal concave border to a convex mass which projects itself into the field. Multiple, cystic, pedunculated and horeshoe shaped tumors are distinguished by careful observation.

Fibrous strictures of the vesical orifice present slightly greater difficulties in the matter of diagnosis. Often in these cases there may be some slight difficulty in introducing the instrument, and frequently there is considerable pain. The vesical orifice presents concave borders over its entire circumference. Observation of the apex of the trigonum vesicae shows a very steep proclivity, so that if it is to be observed closely the eyepiece of the instrument must be very much elevated. Also in observing that portion of the urethra between the vesical orifice and the upper end of the verumontanum a marked declivity is noted and the eyepiece of the instrument must be considerably lowered.

An early diagnosis of these interesting conditions at the vesical orifice is extremely important, just as is an early diagnosis in tuberculosis, carcinoma or any other serious condition. Although obstruction to urination is not such an emergency affair as appendicitis, it is most important that immediate measures be adopted to relieve the obstruction. The harmful results of residual urine with the possibility of back pressure in ureters and kidneys, of easy infection, the formation of stone, etc., are too well known to require a lengthy description in this article.

TREATMENT

In very early cases of enlargement of the subcervical group of tubules there are usually few if any symptoms. As the condition becomes more aggravated there may develop a burning pain on micturition, a disturbance in the force and character of the stream, and a sense of fulness in the perineum and various referred pains down the insides of the thigh, in the small of the back, etc. The patient may also have a sensation that he is not completely emptying the bladder. Catheterization shows a small amount of residual urine. In very early cases only 20 or 30 c.c. may remain after micturition.

In these early cases the administration of hexamethylenamin with acid sodium phosphate or sodium benzoate will render the urine antiseptic, and as there is usually a considerable amount of inflammatory tissue in and around these tumors, the burning and referred pains are frequently relieved by instillations of arygrol, or weak solutions of silver nitrate. The passage of sounds with occasional massage of the regions of the vesical orifice by rectum on the collarlike mass which is felt with the sound in place will sometimes give relief. These and various other palliative measures give temporary relief, but as the fundamental cause of the symptoms is the hypertrophy of the subcervical group and not the inflammation accompanying it, in the end the symptoms become more pronounced and recur as the tumor enlarges.

Occupying, as these tumors do, an extremely strategic position within the sphincter on the floor of the vesical orifice, it is found that as the size increases the obstruction with accompanying evils likewise increases markedly, and steps for removal should be taken.

Fig. 5.—Hypertrophy of subcervical group in three distinct portions which practically block the urethra.

A great many procedures have been recommended. I have found that Young's punch operation is decidedly the best method employed in removing these intrasphincteric masses, be they small, large, unilobular, or trilobular. The instrument is introduced so that the fenestrum is in the posterior urethra. The obturator is withdrawn and the instrument inserted still further until the tumor at the vesical orifice rises into the fenestrum, completely filling it. The cutting inner tube is then introduced and quickly pushed into position, punching out the entire portion of the tumor in the fenestrum. The instrument is then turned obliquely to the right and then to the left, where the same procedure is repeated. The instrument is then withdrawn and a catheter with a large fenestrum introduced. It

is wise to keep a small amount of fluid in the bladder continually, but the former practice of keeping up continuous irrigations has been given up as it seems to delay the clotting of the blood at the cut surfaces and hence delays the healing. As a rule the bleeding stops after a few hours, and the catheter can often be removed after twenty-four or thirty-six hours.

An enlargement of the subcervical group is of such frequent occurrence that digital examination should always be made when a patient is operated on for enlargement of the prostate by the perineal route.

This particular case typifies many others that have come under my observation, and teaches that no prostatectomy is well done unless one searches for a subcervical glandular enlargement at the time of operation.

The suprapubic prostatectomy as practiced by Squier will remove the subcervical group of glands in the natural course of the operation.

The same influences which cause the subcervical gland to enlarge apparently cause prostatic hypertrophy later on, so the punch operation may be followed years after by a prostatectomy. It seems advisable, however, to do this operation in every case which presents symptoms and has any considerable amount of residual urine.

These tumors have been treated by Stevens and others by the high frequency current with splendid results in some instances. When treated in this manner the patients should be kept under close observation for several days as the procedure is sometimes followed in three or four days by terrific hemorrhage due to separation of a slough. As pointed out by McCarthy, occasionally application of the high frequency current has been followed by severe infection. Chetwood's[22] modification of Bottini's[23] operation is also preferred by some operators. The reason why the Young's punch operation seems to be the one of choice in this condition is that the entire tumor is removed at one time without injury to the internal sphincter and without requiring the use of a general anesthetic.

Hypertrophic changes in the musculature of the trigonum vesicae, as it passes over the floor of the vesical orifice, is best treated by Young's punch operation or Chetwood's electrocautery procedure. The high frequency current is of very doubtful benefit, as the resulting scar would be nearly as hard to deal with as the original condition. In some of these cases a course of dilatation with sounds will sometimes give relief. The reason for this is twofold. In the first place the hypertrophy often occurs because of stricture of the urethra, and the passage of sounds relieves the causative element. In the second place, there is a great amount of inflammatory tissue present as a rule which is largely dispelled by the passage of sounds. Often the action can be hastened by digital massage by rectum in the region of the vesical orifice with the sound in the urethra.

Tumors of the subtrigonal group, if not too large, may be removed by Young's intravesical rongeur, which is an exceedingly valuable instrument but must be used with care and intelligence as it is so powerful that if used recklessly there is a possibility of lacerating the vesical wall. It has the advantage of sufficient strength and size to enable the operator to excise a large sized tumor without the use of a general anesthetic. Buerger's operating cystoscope may be utilized if the tumor is very small. The high frequency current has a distinct value in some of these cases, especially if the tumor is pedunculated. If the growth is large and sessile it is sometimes necessary, as it was in one case that I saw in Young's clinic, to do a cystotomy and excise the mass with a scalpel.

Cases of fibrous stricture of the vesical orifice are treated best by Chetwood's electrocautery and Young's punch. Were it not for the fact that an anesthetic is required for the former procedure, it would be decidedly the operation of choice. I have in my series a case treated by Chetwood's method with a perfect result. The criticism that there is danger of burning into the rectum is not justified, since the distance from the vesical orifice through the prostate to its posterior surface is in all my specimens an inch or more. This operation burns through the internal sphincter, and in healing apparently does not permit that structure to resume its physiologic action. Incontinence does not occur, however, if the external sphincter is not injured in performing the external urethrotomy to introduce the instrument. Young's punch is used in these cases, but is not quite so radical as the Chetwood operation and must be followed by sounds occasionally. It has the advantage of not requiring the general anesthetic and of permitting a more rapid convalescence.

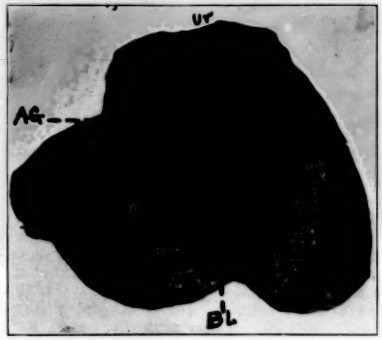

Fig. 6.—Specimen showing marked hypertrophy of subcervical group in three distinct portions which are very large and almost completely block the urethra: *BL*, fundus of bladder, showing marked signs of obstruction; *AG*, subcervical glands divided into three portions; *UR*, urethra at apex of prostate.

Cysts at the vesical orifice are best treated by the high frequency current. One application of the spark is usually all that is required to eradicate the delicate wall. The Buerger operating instrument in a McCarthy's cysto-urethroscope can also be used successfully in this condition. Often cysts in this region arise from a portion of the subcervical group, in which case the remainder of the enlargement must be treated as well, although the cystic portion is usually found to be the major portion of the obstructing mass.

SUMMARY

Most writers express the opinion that the majority of tumors at the vesical orifice are composed of prostatic glandular tissue. My work on the anatomy of this region has shown that glandular tissue extending into the bladder from the floor of the orifice can only be composed of tubules of the subcervical group

22. Chetwood: Tr. Am. Assn. Gen.-Urin. Surg., 1901.
23. Bottini: Di un nuova cauterized incisore termo galvanico, Randall, 1874.

because the vesical sphincter which is quite thick on its posterior aspect is interposed between these tubules and those of the middle lobe of the prostate. Normally the tubules of this group have small lumina. The mucous membrane is made up of two or three layers of low columnar or cuboidal epithelial cells with the nuclei in the center. These cells are disposed on a feltlike basement membrane. There is never a differentiated muscular layer around the tubules, but rarely there is a fibrous tissue envelope.

Structurally they resemble in the adult, when normal, the embryonic prostatic gland tubules. In pathologic specimens the tubules are increased in number and size. The lumina are somewhat larger. The mucous membrane retains its usual appearance, except that occasionally tonguelike projections of slight degree extend into the lumina. The cells usually retain their cuboidal shape with the nuclei in the center, although rarely there are found some cells which approach the cylindric type. There is usually a fibrous tissue development around the tubules, but it is easily differentiated from smooth muscle by the use of Van Gieson's stain. The small size of the tubules, the mucosa made up of several layers of cells, and the lack of differentiated tissue around the tubules have led to the mistaken impression that these tubules are composed of atrophied prostatic tissue, while as a matter of fact they belong to an entirely different group.

Alexander Randall[24] of Philadelphia, in a recent exhaustive study of the literature on this subject, has collected the various prevailing views of the pathology of this region, and I shall quote from his article extensively.

> The German urologists, since the writings of Englisch in 1901, have firmly sustained the view that in the majority of cases the primary change consisted of an atrophic shrinkage of the prostate gland, and that the obstruction to the vesical orifice was due to a secondary distortion from such changes, plus a concomitant sclerosis of the internal sphincter (Englisch, Barth, Groslick, Datyner, Kummell, Posner, Steiner, Burckhardt, Caesar, Dubs, et al.). This conception they have been able to prove by their investigations, and then have shown, as first pointed out by Civiale, that when true bar formations exist at the orifice, there is at the same time a diminution in the size of the prostate. The valve formation of the older writers, consisting of a simple fold of mucous membrane, is not of this type, nor is it of frequent occurrence. Likewise small middle lobe obstruction due to localized glandular hypertrophy forms another type apart from the bar formation due to prostatic atrophy, though with similar obstructive symptoms.

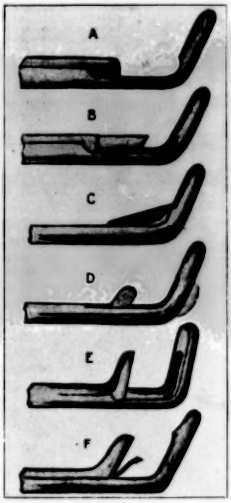

Fig. 7.—Mercier's instruments: *A*, excisor, 1839; *B*, excisor and incisor, 1841; *C*, incisor, 1844; *D*, incisor, 1847; *E*, excisor, 1850; *F*, excisor, 1852 (Randall).

In 1913, the first comprehensive study of the actual obstructive tissue at the orifice was published by Young, comprising the conclusions drawn from over 100 cases in which he had excised the obstruction by means of a special instrument, and subjected the tissue removed to a microscopic study. This work is of immense value, not only as being the sole investigation of so large a group of cases, but especially because it embraces the study of the actual obstructive tissue as it occurs at the vesical orifice. Since the publication of this work covering such a large group of cases, the previous obscure field of the pathologic histology of this condition, aside from its cause, has become more clear. That the cases did not fall into one category was to be expected from the previous work on this subject.

"Prostatic bar" is not a good name for the obstructive tumors at the vesical orifice. It seems to me much better to refer to the condition by using a term more in keeping with the anatomic lesion present. In the cases that I have studied, eighty-eight in number, I have found sixty-eight, or 77 per cent., due to a hypertrophy of the subcervical group of tubules. Ten, or 12.5 per cent., were due to changes in the musculature of the apex of the trigonum vesicae. Four, or 4.5 per cent., tumors of the subtrigonal group were found. Three, or 3.5 per cent., were cases of fibrous stricture of the vesical orifice accompanied by atrophy of the subcervical tubules. Two, or 2.5 per cent., were cysts of the vesical orifice, causing marked obstruction. Only one case of true middle lobe enlargement has come to my attention. Its development is so extensive that it envelops the vesical sphincter and a medium sized hypertrophy of the subcervical group which is entirely embedded in it. This specimen bears out the suggestion made to me some time ago by H. W. Plaggemeyer of Detroit, who is of the opinion that a true middle lobe enlargement does not project through the sphincter, but when that portion of the gland enlarges alone it lifts the sphincter up as well as the apex of the trigonum. It has been my experience that an enlargement of the subcervical group of tubules is frequently accompanied by an enlargement of the prostate gland itself, and adenomatous enlargement of the prostate is in nearly every instance accompanied by hypertrophy of the subcervical group of tubules. Therefore it is assumed that the stimulating influence which causes prostatic adenoma also affects the subcervical group in a similar manner, with the exception that it causes an earlier reaction in the case of the subcervical tubules.

I do not agree with the German view that tumors in this region are always accompanied by a small fibrotic prostate. Chronic inflammatory reaction does, of course, occur in many of the prostates associated with an enlargement of the subcervical group of tubules, but there are no specimens in my series which show atrophy of the prostatic tissue combined with this lesion.

CONCLUSIONS

1. Obstructive tumors at the vesical orifice, exclusive of adenomatous hypertrophy of the prostate proper, are due in my series in sixty-eight, or 77 per cent., of the cases to a hypertrophy of the subcervical group of tubules; and in ten, or 12.5 per cent., of the cases to a hypertrophic change of the musculature of the trigonum vesicae as it passes through the vesical orifice

24. Randall, Alexander: Prostatisme sans prostate, New York Med. Jour., Dec. 4-11, 1915.

to join with that of the urethra. In 4.5 per cent. of the cases, tumors arising from the subtrigonal group are present; 3.5 per cent. of the cases show a fibrous stricture of the vesical orifice; 2.5 per cent. have cystic conditions which cause obstruction; there is only one case in this series which shows a true middle lobe enlargement.

2. The same stimulation which causes an adenomatous hypertrophy of the prostate in most cases causes an overgrowth of the subcervical tubules, and on account of the greater frequency of the occurrence of the latter condition it is assumed that the subcervical tubules respond to the stimulation more promptly than does the prostate itself.

3. The prostate proper is only atrophied when the obstructive mass is due to a fibrosis of the vesical orifice. The subcervical tubules are also atrophied in such a case and are found to be surmounted by many layers of fibrous tissue and to be infiltrated with many small round cells.

4. Any obstruction at the vesical orifice which causes even a slight retention of urine should be treated promptly in order to relieve a condition which might become serious.

5. The treatment should consist of dilatation with sounds, massage and instillations in cases of slight degree. In marked cases with considerable residual urine the operation of choice is Young's punch operation. Chetwood's galvanocautery and the high frequency current may be used in certain selected cases.

6. It is never necessary or desirable to subject the patient to a suprapubic cystotomy for the relief of a tumor at the vesical orifice unless it is accompanied by a general adenomatous hypertrophy of the prostate gland.[25]

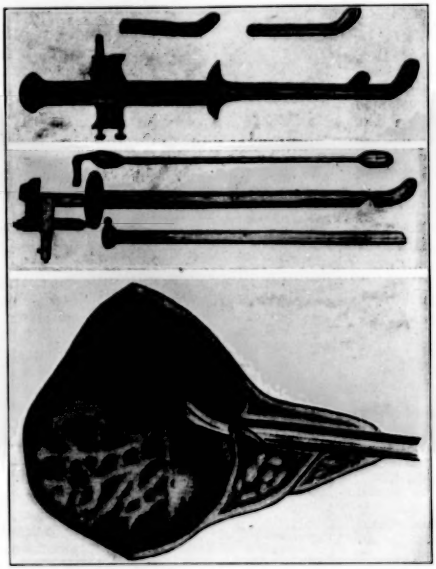

Fig. 8.—Above, Chetwood's galvanocautery; in the center, Young's urethroscope; below, Young's instrument in operation (Randall).

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. CECIL AND LOWSLEY

DR. H. W. PLAGGEMEYER, Detroit: Some years ago Dr. Keyes stated that it is not the size of the obstruction but its position in the urethra and mouth of the bladder that causes subsequent trouble from back pressure. The fact that Dr. Lowsley has found that in 77 per cent. of these cases there is an enlargement of the glands of Albarran and only one definite median lobe enlargement is to me rather astounding. My attention was first called to this some years ago when helping Dr. Young do the perineal operation. After a number of recurrences Dr. Young began to look for some trouble at the mouth of the bladder and in the floor because that is the anatomic position in which an obstruction is most natural and most easy, except possibly in the circular constriction of carcinoma, and in many of the cases he found this little knob about the size of a hazelnut, which was definitely enclosed in its own capsule. It lies in an anatomic plane separate and distinct from the prostate, and in the suprapubic operation it is usually removed. In the perineal operation one should always look for this definite little knob, very often small in size, but which may subsequently cause tremendous impairment of kidney function by back pressure. I cannot exactly subscribe to the idea of the punch operation in this type of case from a purely theoretical standpoint or from the very nature of the pictures Dr. Lowsley has shown this morning, because if this is a definite hyperplasia and we used the punch we would subsequently run the danger of having the after-effects which we did in former cases in what was then supposed to be middle lobe hyperplasia. But the fact that Dr. Lowsley has only found one definite middle lobe enlargement might change our whole view of the subject. I think that this condition which exists here in young men is the condition that we have been looking for so long; what was previously termed inflammation of the bladder. In regard to the high frequency current treatment, it would seem that a preliminary treatment with the high frequency, even to the point of fibrosis, might pave the way for the complete operation by the punch. As far as the temporizing operation is concerned, I do not see much to be gained, because with a definite pathologic condition we would only be putting off the evil day.

DR. H. J. SCHERCK, St. Louis: Some time ago I reported a case and I have since then observed a number of cases of superimposed edema at the vesical neck as a cause of vesical obstruction. This edema may be like a very large tumor mass. In one case the edema was marked when we opened the bladder but we could feel it disappear during the progress of the operation. It was superimposed on a hypertrophy of the prostate. Since that time I have observed the cystoscopic pictures in these cases of vesical retention without enlargement. While there are many causes for it, an important cause I think is unrecognized spinal conditions. They are very common, but the type I especially want to call attention to is

25. In addition to the references already given, the following will be found of interest:

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Fuller: Am. Jour. Med. Sc., 1897, p. 440.

Gray: Tr. Path. Soc., Nov. 20, 1855, p. 252.

Guthrie: On the Anatomy and Diseases of the Urinary and Sexual Organs, Being the First Part of the Lectures Delivered in the Theater of the Royal College of Surgeons in 1830, London, 1836, p. 23.

Greene, R. H.: Fallacies in the Treatment of Urethral Diseases, THE JOURNAL A. M. A., Nov. 9, 1901, p. 1223.

Halle and Melz: Ann. d. mal. d. org. gén.-urin., 1902, **2**, 20.

Langenbeck: Neve. Bibl., Hanover, 1818, **1**, 360.

Marion: Ann. d. mal. d. org. gén.-urin., 1908, p. 1670.

Posner, H.: Ztschr. f. Urol., 1913, **7**, 277.

this edema. This edema of the vesical neck, even involving the prostatic urethra, when the pressure is from behind, is a distinct entity. In two cases where I could not discover any cause except that for retention I have through the operating cystoscope simply divided the vesical neck two or three times with a little knife just sufficiently to deplete it to some extent, and the retention disappeared for a number of days, until the wound healed, and then the edema appeared again. This condition may be so slight as to be hardly observable. I believe that in many cases the punch or the cautery operation has the effect of depleting the parts which serve the purpose of relieving the obstruction. If the operation is sufficient to leave a groove the effect is permanent. In one case the condition recurred again. I believe that edema of the vesical neck as a result of an inflammatory condition of the verumontanum, or as an incident in a general arteriosclerosis or a nephritis, may be a cause.

DR. LELAND BOOGHER, St. Louis: It falls to the lot of all of us to drain the urine in these cases, and it depends on how we can best serve the patient in the drainage. A few years ago I read a paper on malarial hematuria, and I was severely criticized because I had drained a bladder of 2,500 c.c. at one sitting. I have lately had several cases, and one that far surpassed that. Of course, this drainage was done under observation, the patient being in the care of a nurse or a physician all the time. The advantage of this drainage at one time, doing it very slowly and only allowing a very fine needle-stream to flow, is that you will regain the muscular activity of the bladder. About a month ago a man entered my office to get relief from an acute retention. I examined him, and found he had a watermelon abdomen. He was suffering acutely. Because of the immense dilatation of the bladder an instrument was easily passed at that time, and was left in situ from 11:30 to 5:30 in the afternoon. At that time 3,200 c.c. had passed from that bladder. The man had not been able to urinate and had been using a catheter for four months. That night he passed 1,000 c.c. He has not used a catheter since, and the musculature of the bladder has come back into play. You can drain a little bit at a time and you can so weaken the bladder that it will lose its muscular activity. But if it is done slowly, at one sitting, there is 75 per cent. chance of regaining the muscular activity and of overcoming the irritation around the prostatic orifice.

DR. A. J. CROWELL, Charlotte, N. C.: I have during the last two or three years had a number of cases of retention of urine in young men that I think undoubtedly was due to enlarged verumontanum. At least, the treatment for hypertrophied verumontanum did away with the retention. We should keep this in mind in thinking of obstructions at the vesical neck in young men.

DR. PAUL M. PILCHER, Brooklyn: We must not draw conclusions as to the pathologic anatomy in these cases from specimens removed postmortem in cases in which there has not been urinary obstruction. The surgical pathology existing in the cases in which we have actual obstruction is different from that in which we find anomalies or deformities at the vesical neck in which we do not have obstruction. I believe our conclusions should only be drawn from those specimens removed from patients where actual obstruction took place. I also feel that we may be overenthusiastic in considering these subcervical and subtrigonal glands as the cause of the obstruction in so many of these cases. I feel that there is a close relationship between the tubules described as the subtrigonal and subcervical and the actual tubules which form the various lobules of the prostate. I believe there must be some error in concluding that the middle lobe obstruction is so rare. I have been a great admirer of Dr. Lowsley's work and have followed it very closely and am not criticizing it, but I want to be convinced more fully, and I do not think we are yet in a position to pass final judgment.

DR. EDWARD L. KEYES, JR., New York: Dr. Lowsley has studied the anatomic and pathologic prostrate for many years, and I am glad to testify to the accuracy of his pathologic findings. Dr. Pilcher will find in the literature several descriptions of the glands of Albarran concurring with Dr. Lowsley's. I venture, however, to call Dr. Lowsley's attention to the fact that the Chetwood operation can and has been done by me under local anesthesia. Removing the small prostate, notably the small fibrous prostate, is the most difficult surgical problem of prostatectomy. The solution of that problem I am coming more and more to think is not the high frequency current or the Young punch or the Chetwood operation, or any other of these devices whereby the obstruction is more or less fully relieved. We shave the tip off the prostatic enlargement, with relief for a while, then relapse. Having done about fifty Chetwood operations, I made a report of twenty-five followed more than a year. The mortality was very low. In the main the results were good. At that time—three or four years ago—I reported a certain number of recurrences. Last week I operated on two more patients with recurrences. If during a suprapubic operation you put your finger in and feel nothing but a tightly grasping contracture, put your finger through that contracture and remove the little intra-urethral sclerotic lobes.

Reflex retention in the male is what the French have called "prostatisme sans prostate," that is, retention of urine without notable prostatic enlargement as felt by rectum. The causes may be thus classified: First, small carcinomas. These may usually be diagnosed by rectal examination on a sound in the urethra. Second, tabes; diagnosed by spinal fluid, suggested by absence of the ankle jerk. Third, the small hypertrophy, which gives a normal prostate as felt by rectum, and is diagnosed by cystoscopy. Fourth, diverticula, which also are diagnosed by cystoscopy. Fifth, the true reflex. A few months ago the general service in Bellevue sent down a case with retention of urine. They had pronounced the rectum normal; but we found a linear stricture of the rectum. This man had several ounces of residual urine, an inflammation of the bladder and frequent urination. We anesthetized him, split his stricture, and cured him. We had a second patient whose inflamed bladder and retention of urine were due to fissure in ano. Operating on his fissure relieved all his urinary symptoms.

DR. ARTHUR B. CECIL, Los Angeles: When I took up the subject of reflex retention of urine I realized that as a clinical entity chronic reflex retention of urine would be doubted. It is true that the large majority of retentions of urine are mechanical in origin, due to obstruction in the urethra or at the neck of the bladder. If they are not of mechanical origin we have to consider and keep in mind the great difficulty of diagnosing certain obscure nerve lesions. In any questionable case a Wassermann test of the spinal fluid should certainly be made. In the cases I reported it is evident that the woman from whom was removed the hydronephrotic kidney and who was cured of her bladder disturbances was suffering from a chronic reflex retention of urine. It is also true that the case of marked seminal vesiculitis was cured by massage of the seminal vesicles. I might say that this man had previously been operated on suprapubically without relief. Chronic reflex retention of urine is not a common condition but it is undoubtedly occasionally responsible for some of the cases of inability to empty the bladder.

DR. OSWALD S. LOWSLEY, New York: I am really very glad to get Dr. Pilcher's suggestion and Dr. Plaggemeyer's suggestion that we go slow in blaming the subcervical group tubule enlargement for so many things. I suppose we are inclined to get overenthusiastic about any proposition that we work on a long time. I have dissected so many of these cases and have worked on them so hard that I think I am pretty nearly right about my observations concerning the middle lobe. There are surprisingly few middle lobes which project into the region of the neck of the bladder. When there is hypertrophy of the lateral lobes, there is always hypertrophy of the middle lobe as well, but it is just a connection between the two. Anatomically it seems almost impossible for it to project into the bladder in the usual way because the so-called middle lobe, which I believe is Albarran's group, projecting into the bladder, is within the sphincter. The middle lobe cannot, I think, project into the sphincter, because it occurs behind the sphincter. It does not go back, turn a corner and go into the sphincter. This one enormous specimen sticks right out, and there is no doubt about that, but practically all of these specimens removed at operation—I have studied a very great many of them—usually have more or less the appearance of that specimen which I passed around

showing the subcervical group separated from everything else by the sphincter and attached to the upper end of the verumontanum and the middle lobe adjoining, with the two lateral lobes, to form the adenomatous hypertrophy. Dr. Keyes' point was well made about not shaving the tip off of this little nubbin that sticks out. Of course, you do not do that, because the whole mass projects directly within the vesical orifice, and in doing the punch operation you take out everything that projects, and there is not much left to grow out, because you take away the whole mass but I always tell my older patients who have not had a prostatectomy performed that they may have to have it later on. Even if it is only palliative, it gives them good drainage. It has the same effect as wearing an indwelling catheter. Then if the prostate becomes obstructive, as it is liable to do in these old men, you have already promised him that he might have to have a more serious operation later on, but, in the meantime, this palliative procedure is still worth while in my opinion. In the younger men, the men around 30 and 40, you do not have to consider that point, because, as a rule, the enlargement of the prostate is not considerable.

Edema at the vesical orifice is quite prevalent. The thing to do is to find the cause of the edema and relieve it, but in finding the cause it is possible to get a temporary relief, in which case some form of cauterization is better, either silver nitrate or the high frequency current or some such procedure. I am very glad to know that Dr. Chetwood's operation can be performed successfully under local anesthesia. In cases of fibrous stricture of the vesical orifice that is the operation that should always be performed, if it can be done under local anesthesia. The results are always good.

THE OPERATIVE TREATMENT OF TUBERCULOSIS OF THE SPINE *

NATHANIEL ALLISON, M.D.
AND
HERBERT H. HAGAN, M.D.
ST. LOUIS

This report is made in order to give our experience with forty cases of tuberculosis of the spine in which operation has been performed in a manner designed to stiffen their spinal columns by internal splintage. Two methods of operation have been used: the osteoplastic operation, known as the Hibbs operation, and the bone transplant operation, known as the Albee operation.

Of the forty patients operated on, nine had reached adult life before the onset of the disease, and thirty-one were children. The oldest patient was 37 years of age and the youngest 19 months of age. The diagnosis of tuberculosis of the spine was made positive in each case by roentgenographic study, the exact location and extent of the disease being clearly made out, and by clinical tests for tuberculosis, and, wherever possible, by guinea-pig inoculation.

Our first operation was done Oct. 5, 1912. Six patients were operated on in 1913; eleven patients in 1914; fourteen patients in 1915 and nine patients of this group in 1916. Of these forty patients, ten were operated on by the method of Hibbs and thirty by the method of Albee.

We have divided the cases into three groups in order more briefly to present their clinical characteristics.

Group 1: Patients operated on in the early stages of Pott's disease with little or no evidence of deformity and no complications.

Under this head fifteen of our forty cases fall. Without exception, this group of fifteen patients have stood the operation well, have had rapid convalescence, all symptoms have disappeared, and we feel that they represent complete recovery.

Group 2: Patients operated on that presented well marked deformity with persistence of more or less acute symptoms, but no complications.

Under this head nine of our forty patients are collected. Of these nine, eight have made recovery and are about without supports and are in fairly robust health. One patient has shown a return of acute symptoms after three years, and has signs of a developing pressure paralysis.

This patient was operated on after the method of Hibbs and did very well up to three months ago. She is now being treated as one would treat conservatively a case of Pott's disease with paraplegia.

Group 3: Patients who were operated on in the presence of complications to their more or less acute processes of tuberculosis of the spine.

Fig. 1.—Roentgenogram of bone graft taken one year after operation, showing fracture of graft at seat of disease.

These complications were: psoas or lumbar abscess, 5 cases; tuberculosis of other joints, 2 cases; pressure paralysis, 5 cases; pregnancy, 1 case; pulmonary tuberculosis, 4 cases.

Psoas or Lumbar Abscess.—Of the five cases that presented abscess formation as a complication to the Pott's disease, three were treated conservatively as far as the Pott's disease was concerned, and the abscess was opened, its contents cleaned out, and the wound closed. In these three cases we had primary union of the incision for the cleaning out of the abscess.

The operation on the spine was then undertaken. In one of these cases the abscess refilled and discharged through the line of incision. In the other two cases the abscess did not refill.

These three abscesses were psoas abscesses.

In two of the cases, abscesses occurred after the operation on the spine, and they were treated in a similar manner. In one case we obtained healing, and in the second case the abscess continued to discharge but finally closed.

We are led to believe from this experience that abscess formation is not a contraindication to the operation on the spine.

Tuberculosis of Other Joints.—In two of our cases, in addition to having Pott's disease the patients had also tuberculosis of the hip joint. After the subsidence of acute symptoms the spine was operated on, and the hip has been treated conservatively in the ordinary manner. One case has been treated with a jacket spica and the other with a Bradford abduction hip splint. Neither of these patients has shown any retardation in their convalescence since the operation.

* Read before the Section on Orthopedic Surgery at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

Paraplegia.—Five of our patients have shown symptoms of spinal pressure evidenced by increased reflexes, ankle clonus, and inability to walk or stand.

One of these patients, a man of 30, had symptoms of Pott's disease for five years with a gradually increasing deformity. About two years ago he noticed a jerking of his legs when bearing heavy weight on his toes; shortly after this his legs

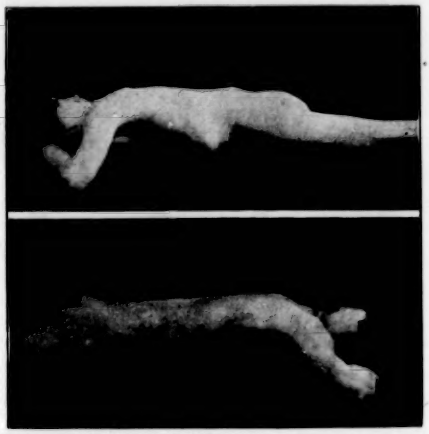

Fig. 2.—Lessening of deformity after Albee operation.

became weak, especially the right one, and now the toes drag on the floor when walking, and his gait is very stiff. The physical examination showed a sharp line of hyperesthesia extending across the trunk at the level of the sixth dorsal on the right and the fifth dorsal on the left. Below this there was definite hypalgesia. On this man an Albee operation was done, Sept. 16, 1914. After the operation his area of hypalgesia gradually lessened and entirely disappeared, his ankle clonus, spasticity, and plus reflexes have now disappeared, and he is about without symptoms.

The second patient, 2 years of age, Jan. 27, 1915, showed clonus on both sides, Babinski on both sides, and very active knee jerks, and no voluntary power of the thigh or legs. He was operated on, March 22, 1915, an Albee operation being done from the seventh cervical to the tenth dorsal, being secured by a tibial graft. April 5, 1915, voluntary power had returned to some extent, in both legs, Babinski was still present, and clonus still present. April 28, the child began running a temperature with no assignable cause. May 19, patient is able to move his legs very well. Babinski has disappeared and also clonus. June 26, after a gradual onset, the child died of tuberculous meningitis. One other child in this group who had complete paraplegia died three weeks after the operation of tuberculous meningitis.

The two remaining cases of this group had only slight involvements, evidenced by ankle clonus, slight spasticity and positive Babinski. These two patients after operation rapidly improved. The signs of spinal pressure disappeared, and they are now about without symptoms.

We have been led to conclude from our experience with paraplegia as a complication in Pott's disease that an operation should immediately be done, as it seems to us to offer the best chance for a speedy recovery from the pressure on the spinal cord.

The two patients in this group who died died of tuberculous meningitis, and we have no explanation to offer for the occurrence of this fatal complication.

Pregnancy.—One of our patients, a woman of 19, had just recovered from her first pregnancy when she began to notice the symptoms of Pott's disease.

She had a well marked and rapid destruction of her first lumbar vertebra, and appeared at the hospital with her five months old infant. The infant was weaned and the mother was operated on several weeks later, a perfect result being obtained. She gained weight and was about without symptoms at the end of ten weeks and was discharged to her home. In spite of our advice she returned to the hospital at the end of six months again in a state of pregnancy. This pregnancy was allowed to run full term and a normal infant was born. The mother made a normal recovery, and since then has had no symptoms of activity in her diseased spine. A roentgenogram of her graft illustrates this report. This was taken after her second pregnancy and shows the graft in good position but broken through its middle.

In passing, it has been our experience in the study of these grafts after they have been placed in the spine that some of them show signs of fracture after a more or less indefinite period without causing any evidence of trouble.

Pulmonary Tuberculosis.—In our group of forty cases we have had four cases that showed signs of more or less active pulmonary involvement. In spite of this complication we have done the operation, doing it as rapidly as possible, so as to cut down the length of time required for the administration of the anesthetic. It has been our custom in these cases, and we might add in all cases where the physical condition of the patient was below par, to prepare the patient completely for operation and have everything ready to go ahead before the anesthetic is administered. As soon as the patient passes the primary stage of anesthesia, the operation is then started and finished as rapidly as possible. In this

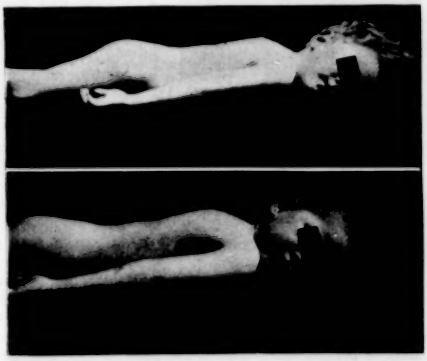

Fig. 3.—Lessening of deformity and rapid improvement in general condition after Albee operation.

way considerable time has been saved. In none of these four cases has there been any evidence of the operation causing increased activity in the pulmonary involvement.

Complications from the Operative Procedure.—In three of the forty patients operated on there has been infection at the time of operation of the operative wound.

One of these patients, a man of 27, developed a severe *Staphylococcus aureus* infection on the third day after operation in both the wound on the shin and in the back. After a very serious illness from this infection he gradually recovered and his wounds closed. Two pieces of his graft were discharged; one from the upper end of the wound and one from the lower. Healing finally took place and his result has been an excellent one.

The other two cases were slight infections, one of them involving the lower end of the graft, which was discharged, the other being simply a superficial infection at the site of the skin sutures. The other thirty-seven operated cases healed by primary union.

We have been struck in this series of cases, especially in children, with the immediate improvement in general health and with the rapid convalescence that these patients have made after operation. Almost without exception, the children have gained weight, have become very active when allowed to be up, and presented a marked contrast to the slow improvement seen in cases treated conservatively.

We discovered, what seems to us, to be a valuable method of holding these cases fixed immediately after operation. It is our custom to reverse the Whitman frame so that it lies concave on the bed, and place the child, face down, on this frame, securely binding it as one would in the reverse position. In this way there is no pressure on the operative wound, and the position of hyperextension is more or less perfectly kept up.

Fig. 4.—Ability to flex the spine one year after Albee operation.

We feel from our experience that it is highly advisable, and, indeed, in certain cases necessary to continue support for at least one year after the time of operation. We are led to this belief by the character of bone regeneration which must take place before the spinal column becomes securely ankylosed, and we feel that the too early removal of supports is likely to result in a return of symptoms and an increase in deformity.

SUMMARY

Forty patients were operated on.

Two deaths were due to tuberculous meningitis.

There were three infections at the time of operation without serious consequences.

Fifteen patients completely recovered without deformity or complication, and at the present time are far enough along since their operation to be called absolutely well.

Eight patients have deformity, but with the disease arrested and no active symptoms.

Of the sixteen patients who had complications, three with paraplegia have completely recovered, and two have died.

Of those with pulmonary tuberculosis (four patients) there is evidence of activity of disease at present, but the disease of the spine is not causing symptoms.

Of the patients with tuberculosis of other joints (two) these are still under treatment, but are making slower recoveries.

Of the patients with psoas abscess (five) all five have recovered and the abscesses have ceased to discharge.

The total of this group would be four cases of pulmonary tuberculosis, and two of tuberculosis of other joints, making six still under observation, leaving ten in which the disease has been arrested.

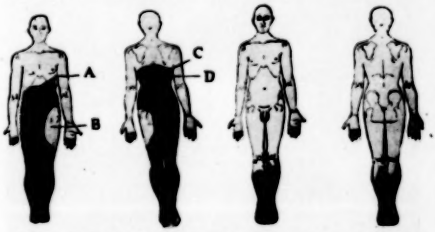

Fig. 5.—Rapid improvement in sensory changes in a case of paraplegia after Albee operation; three weeks' time; patient made complete recovery: shaded area, hypalgesia; *A*, narrow zone to hyperalgesia; *B*, area of normal to increased response to pin prick; *C*, hyperalgetic zone; *D*, gibbous.

We are led to believe from this experience with forty cases that an operation for ankylosing the spine should be performed in every case of Pott's disease as early as a diagnosis can be accurately made, and that the presence of complications should not influence the surgeon in delaying the operative procedure, unless the complications are of too grave a nature.

We do not feel in a position to discuss the relative merits of the Albee operation and the Hibbs operation. We have had equally good results with each procedure. We feel, however, that the Albee operation is more simply done and that on this account it is advisable in the majority of instances.

Our experience with adults and children has been about the same. We feel, however, that the good results obtained are much more conclusive in the case of adults, who respond very slowly to conservative measures.

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ABSTRACT OF DISCUSSION

DR. J. T. RUGH, Philadelphia: I want to endorse all that Dr. Allison said regarding the after-treatment of these patients.

Fig. 6.—Reversed Whitman frame used for fixation after operation.

He has shown clearly the unwisdom of leaving off the support too early in these cases, especially in young children. Support must be maintained until bony union takes place, which requires six months to a year or a year and a half. I operated in one of these cases by the Albee method, a case of tuberculosis of the atlas and axis. The child was struck on the side of the neck with a baseball bat. About four hours

later he dropped in the street paralyzed. It was thought that the paralysis had come from the injury, but the subsequent history showed that he evidently had a tuberculous lesion there and that this accident had simply precipitated the entire trouble. He remained paralyzed for four or five weeks, when an abscess ruptured on the side of his neck and discharged, after which the paralysis cleared up. He came under my care a year and a half after the onset of the tuberculous trouble, with slight spasticity in the lower extremities. I dug a hole in the occiput, and measured my graft to fit between it and in contact with the third and fourth cervical spines. I placed the end of the graft in the lower pocket, tilted the head forward, and inserted the graft into the hole in the occiput. Then I tilted the head back and sewed the graft into place. There were no complications, and he made a splendid recovery. The paralysis has entirely disappeared. Before I operated, if his head tilted forward, he would immediately become paralyzed; and it had to be held back from six to eight hours before the paralysis disappeared. Since the operation, there has not been this trouble.

DR. JAMES T. WATKINS, San Francisco: I want to show you pictures of the spine of a child who died several months after I had performed a Hibbs operation. The morbid process involved the bodies of two vertebrae in the middorsal region, and at our operation we synostosed the laminae of six vertebrae, going well above and below the lesion. Dr. Ely said that his sections showed that the spines had disappeared. By that I suppose he meant that they had lost their configuration as spines and had become fused with the laminae. One can still differentiate them in the picture.

NEW METHODS OF PRECISION IN THE TREATMENT OF FRACTURES *

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BRIDGEPORT, CONN.

The treatment of fractures is largely a mechanical problem, and in spite of the fact that this is a mechanical age, little progress has been made in the mechanics of fracture treatment. In fact, the assertion has been made that many of the methods and devices in use today might easily be mistaken for implements belonging to the era of the wooden plow. Even the method of applying weights to fractures of the femur, as popularized by Gordon Buck as recently as fifty years ago, would have a familiar look to some of the ancients.

It is true, of course, that advance has taken place in the care of fractures; but the advance has largely been incidental to the development of roentgenography, and in the direction of technical and instrumental improvements in the operative treatment of fractures.

The simple methods have not received the attention which is their due, and even in the operative methods, the development has been in the direction of applied mechanics. One thing Lane emphatically demonstrated is the fact that successful fracture operations are impossible without efficient instruments and without a technical dexterity in the handling of exposed tissues hitherto unknown.

It is strange in this age of automatic machinery and instruments of precision to see so much dependence placed on the manual treatment of fractures. It is strange because hands must vary considerably in strength, skill and performance. The tradition "hand made" has lost much of its glamor. There would be no such things as automobiles, aeroplanes or submarines if their parts had to be turned out by hand. When it comes to precision and uniformity, mechanical methods must supersede the manual in the treatment of fractures, as in any other work in which the intelligent application of force is required. Any one who has attempted to exert traction on a broken limb and to hold it in a fixed position appreciates that it is not as simple as it looks. Even skilled hands become unsteady and fatigued. The element of unreliability is always present and increases with the inexperience of those who assist in the undertaking.

The time was when the diagnosis of fractures was made without the mechanical aid of the Roentgen machine, and the time is fast approaching when the treatment will not be undertaken without methods and apparatus of precision. It is impossible to apply force accurately by methods which are necessarily inaccurate. The opportunity for improvement in the simple methods of fracture treatment is abundant, and as these simple methods are made more efficient the necessity for open reduction will diminish.

The time is not far off when fractures will be almost entirely treated in hospitals. In fact, it will be difficult, as well as dangerous, to attempt to do so, because the public will be aware that complete scientific equipment for diagnosis and treatment can be found only in such institutions. There are few communities in which people are not within reach of a fairly modern hospital. Here they can be efficiently and promptly treated and sent home to convalesce. In this way, fracture patients become no burden to a hospital.

At the same time it will be necessary for the hospitals to devote more attention to the care of fracture cases. The public is becoming educated, and it is a public accustomed to "modern improvements." Moreover, the industrial world, which pays the disability bills in occupational fractures, is becoming interested. Not only must the apparatus be efficient, but its use must be in the hands of men especially trained for the work. It will no longer do to divide the fracture cases into small lots and assign them to men whose chief qualifications are that they are interested and proficient in abdominal surgery.

With the introduction of more precise methods, the treatment of fracture cases will become more systematic. Much of the unnecessary handling of broken limbs will be eliminated. This will save a vast amount of needless suffering and promote the processes of repair. One of the noticeable features will be the dispatch with which these cases will be handled.

There is no reason why a fracture patient entering a hospital should not be placed on a bed and a splint applied which permits physical and roentgenographic examination without disturbing the limb in any way. There is no reason why roentgenograms should not be taken at once, so that when the attending surgeon arrives, the complete record is before him and the permanent treatment can be instituted without delay. This simulates the treatment of surgical fractures (osteotomies) in which almost no difficulty is experienced, because the bones are approximated and immobilized before the muscular contractions have become fixed.

In the treatment of some 3,000 cases of fracture during the last seven years, I have preached and practiced the immediate reduction and immobilization of fractures under ether. During this time, I have never

* Read before the Section on Orthopedic Surgery at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

cut or split a cast in anticipation or on account of swelling. In fact, the only cases of extensive swelling or of bleb formation (so commonly associated with fracture) which I have seen are those in which the treatment was delayed. As I have successfully proved to myself that the mortality and suffering in fracture of the hip in old people is directly due to conservative treatment, so I believe that if we are looking for swelling and trouble, then treat fractures expectantly. If we wait until the swelling disappears, it is only necessary to wait for it will not disappoint us.

THE TREATMENT OF FRACTURES OF THE FEMUR *

F. E. PECKHAM, M.D.
PROVIDENCE, R. I.

1. THE MIDDLE THIRD

Fractures of the femur in the middle third have aroused considerable discussion in recent times regarding methods of treatment. Different mechanical methods have been advocated by different surgeons, and finally the open method with the use of Lane plates occupied the center of the stage and caused quite a little excitement.

A fracture is a definite mechanical problem. First of all, a roentgenogram is necessary to see exactly what the condition is, whether transverse, oblique or comminuted. How far the fragments are riding by is also a good thing to know. In these fractures, the result is so easily obtained that, in the great majority of cases, no anesthesia is necessary, and there is no "setting of the bone" in the ordinary acceptation of that expression. Every orthopedic man learned during his early hospital training that an acute tuberculosis of the hip with its muscular rigidity and flexion deformity was

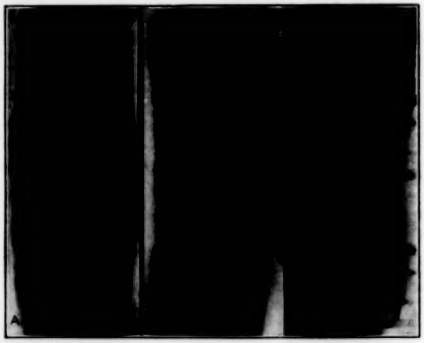

Fig. 1 (Case 1).—Oblique fracture of femur: *A*, fragments pulled down to length; *B*, *C*, result of gradually tightening the coaptation splints.

overcome by traction. Pain was relieved almost instantly and muscular contraction was overcome by constant, incessant and efficient traction.

In a fracture of the middle third of the femur, traction properly and efficiently applied will just as surely overcome the muscular contraction which is the cause of the fragments riding by, thus producing shortening. For traction to be efficiently applied in this particular condition, countertraction must be equally efficient. Here is where the treatment, as usually prescribed in

Fig. 2 (Case 2).—Oblique fracture of femur: *A*, fragments pulled too far apart by over an inch; *B*, apposition obtained by lessening the weight; *C*, condition a little less than a year after the injury.

textbooks, fails. Efficient countertraction or counterextension is considered to be accomplished by elevating the foot of the bed. Nothing could be further from the truth. Elevation of the bed is usually (although not always) necessary; but to get really efficient counterextension, a well padded perineal band is placed in the groin, one of the straps going over the front of the body, the other going beneath the body, with a pulley at the head of the bed. Weights are then added to both the foot and the head of the bed, varying according to the necessities in the individual case. In the direct extension, anywhere from 10 to 40 pounds may be necessary. The foot of the bed may be elevated as usual and then about one-half the weight necessary in the direct extension may be added for the counterextension. If 30 or 40 pounds are necessary for the extension, then use 15 pounds for the counterextension. This makes a traction in each direction, thus pulling the fragments apart in the longitudinal direction of the leg.

If this "two way" pull is kept up constantly, incessantly and efficiently, there is usually only one thing can happen, and that is, the fragments will be pulled down so that, in the middle third, they will almost fall into apposition. Coaptation splints may be placed about the leg, but they do not need to be really adjusted and tightened until the leg is down to length. Now and then, a strand of tissue may be caught in such a way as to hold one end from just going into position. Under such conditions, pressure and counterpressure by pads of sheet cotton beneath the coaptation splints will usually correct. In case there should be a large piece of muscle interposed to prevent apposition, then all that is necessary is to take the patient to the operating room, bed and all, without removing the extension weights. After the usual preparation, make the incision, expose the fragments, remove the obstruction,

* Read before the Section on Orthopedic Surgery at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

* Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints.

and the ends will either fall into apposition or can be easily held by the coaptation splints over a light surgical dressing.

This method would seem to reduce the treatment of fractures in this location to their very simplest terms, and I wish to report some cases treated in this manner:

CASE 1.—Mr. A. An oblique fracture of the femur with about 2 inches' shortening. Extension of about 40 pounds with foot of bed elevated and counterextension of 15 pounds. At end of ten days with coaptation splints tightened, the fragments were down and together (Fig. 1). Discharged from hospital with no shortening. This case was treated about one year ago, and a letter from the man states that he is at work (putting in elevators) and that he walks without a limp.

CASE 2.—Mrs. B. This was an oblique fracture of the femur with 1½ inches' shortening. Extension of 35 pounds with foot of bed elevated, and counterextension of 15 pounds. At end of two weeks (Fig. 2 *A*) the fragments had been pulled over an inch apart, i. e., the leg had been pulled down until it was that much too long. Removing 10 pounds from the direct extension, the leg shortened up till the fragments were in apposition, as shown in Figure 2 *B*. This was treated a little less than a year ago, and in April, 1916, the patient reported at my office with no shortening, no limp, and the Roentgen ray shows the condition in Figure 2 *C*.

CASE 3.—Boy, aged 4 years. Oblique fracture in middle third of femur. Extension of 15 pounds with counterextension of 10 pounds easily brought the leg down to length (Fig. 3 *A*), but the Roentgen ray showed the fragments "back to back" (Fig. 3 *B*) instead of edge to edge. Under ether, an attempt was made to readjust them, but with no result. Then the boy was taken to the operating room in his bed, with extension and counterextension in full force (Fig. 4). The leg was cleared of adhesive straps from the knee up and prepared for operation in situ. An incision was made through the skin, and then the muscle bluntly dissected to the bone, where a piece of muscular tissue was removed from between the fragments. The broken ends fell into apposition immediately. The skin was sutured and a light surgical dressing

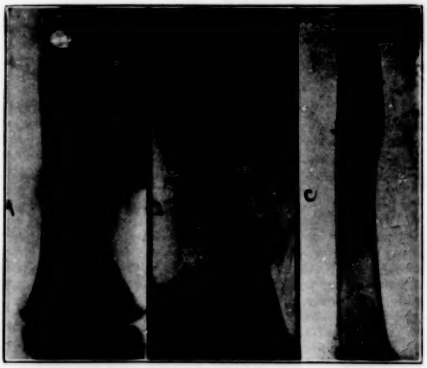

Fig. 3 (Case 3).—Oblique fracture in middle third of femur: *A*, leg pulled down to length: *B*, fragments back to back instead of in proper apposition; *C*, union some months afterward.

applied, and boy, bed and all returned to the ward. Union promptly resulted, with a perfect leg, as shown in Figure 3 *C*.

2. FRACTURES OF THE HIP

Appreciating that with extension and counterextension, the leg can hardly help coming down to length, it occurred to me that with proper mechanics, fractures of the hip could be readily treated without the use of the plaster spicas. A number of hips at different times having been opened through the anterior incision for the purpose of exploration and freshening of the broken surfaces, it was ascertained in this way ocularly that if the leg was pulled down to length and strongly internally rotated, the broken ends became locked in apposition. The getting down to length is easily accomplished by efficient extension and counterextension, as already described. The internal rotation is easily

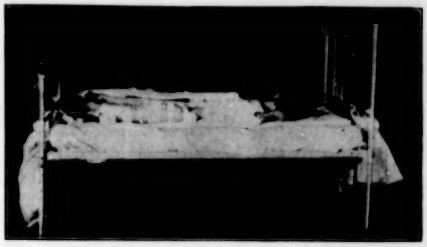

Fig. 4.—Method of extension and counterextension.

accomplished by rotary pulls by means of adhesive plaster straps extending around the leg from the top, over the inside and under the leg, then passing up over a particularly wide T splint. In this way the extreme degree of internal rotation may be obtained and held. With these mechanics kept perfectly efficient, the fragments are kept locked in apposition as verified by the Roentgen ray.

I wish to report two cases to demonstrate the efficiency of the mechanics:

CASE 4.—A man sustained a fracture through the great trochanter with shortening of 1¾ inches. The leg was pulled down and internally rotated, thus bringing the broken surfaces into accurate apposition. The recovery was perfect, with possible flexion.

CASE 5.—A boy sustained a separation of the epiphysis of the right hip, but continued to walk around on it, although lame and painful. Three months after the accident, the boy was brought for examination. The Roentgen ray showed the condition. Efficient extension and counterextension with strong internal rotation brought the hip down into position. Union was obtained, however, and scarification of the surfaces became necessary, but the roentgenograms are exhibited to demonstrate the possibilities of the mechanics as described above.

The results in these two cases were so encouraging that others have been treated in a similar manner with similar results. When treated in this way, the back and whole body is easily reached with alcohol and powder, and the patients are much more comfortable than those I have seen in plaster spicas.

266 Benefit Street.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. HAWLEY AND PECKHAM

DR. FRED H. ALBEE, New York: We employ the Hawley table in all cases of fracture in any part of the body where it is difficult to get replacement and hold the fragments firmly in position.

DR. J. T. RUGH, Philadelphia: I want to speak of three cases of ununited fracture of the hip, one in a woman past 60 years of age. Two of these cases have been entire successes, and the third patient is not cured. In a case of old fracture of the neck of the femur a graft was placed.

That patient, at the end of many months, is walking well, with perfect results. A case of twisted fracture was also an excellent result. In another case there was some comminution in the head of the bone. When the graft was placed it, unfortunately, did not penetrate as far into the innermost piece of the head of the femur as it should. It has been a year and a half since the operation, and the patient is not yet walking. I could not understand why until I found that the graft did not penetrate all the fragments. I think that the secret of success is to get the peg through both or all the fragments. Then it does not make any difference whether the peg is round or square. If it is through in proper position, the result will be good.

DR. JOHN RIDLON, Chicago: As to the Hawley leverage device for congenital dislocation of the hip, I would say, in the first place, that it is not necessary to use any leverage device to replace a congenital dislocation of the hip. In the second place, it is dangerous to use it; because, with a leverage device like that and the one on the Bartlett apparatus, it is possible to fracture the neck of the femur. We fractured one with the Bartlett apparatus. As to Dr. Peckham's fracture work, it is possible to pull down some fractures of the shaft of the femur; and when you have pulled down three or four, you think that you can do this in all cases; but you cannot. I have had a case in a man of great muscle development where 58 pounds' weight for 8 days did not reduce the displacement at all. We have to use traction, in such cases, to an enormous amount to pull the fragments down; and when they have been pulled down, they do not always "drop into place," and we cannot always manipulate them into place. In this case, when the leg was opened and the bones pulled down with a space of half an inch between the ends of the fragments, and the traction slowly relaxed, instead of the fragments going end to end, they went just where they were before; and there was no tissue between the ends, muscle or otherwise.

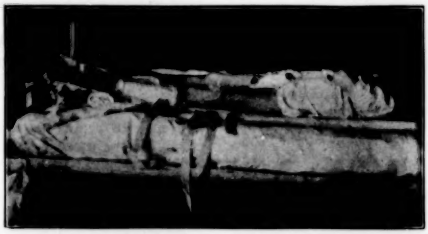

Fig. 5.—Wound the day the stitches were removed; method of operating.

DR. H. R. ALLEN, Indianapolis: I enjoyed the demonstration of the use of the operating table with all of its fancy attachments and complications and believe it would be very gratifying to a man who feels that the plaster of Paris dressings are essential or scientific. Personally, I do not use such dressings for any human condition that I have ever seen. I do not like the use of inadjustable splints that conceal the results. I prefer splints made of wire and adhesive plaster. They are light, cheap, adjustable and sanitary, and permit inspection at all times. Such splints do not conceal errors. If you choose you can apply the splint before operating, then when the operation is through you are through. These splints do all that a plaster splint can do and as much more as you desire. They are easy to make and easy to apply and they are comfortable and do what is expected of them. I agree with Dr. Ridlon. But Dr. Peckham has never found a case that could not be reduced by traction alone. Dr. Ridlon and I and others have found plenty of this variety. Suppose you have a square ended fracture with overriding in a thigh whose ham-strings are tight on simple knee extension, how would you expect the jagged ends of the bone to slip past each other into place? If you unlock the thigh muscles by flexing the knee then the fragments will easily go to place. Then, after flexed reduction you lock the broken ends tight together by complete knee extension. There is a use for this mechanical tightening of the ham-strings but this use is not absolutely dependable. Dr. Peckham's method of traction will reduce most of the spinal fractures of the thigh, but what good is reduction by any method unless you follow it up with some guaranteed method of maintaining reduction. Really, the maintenance of reduction is all that counts since every bone will unite in the position in which it is held and in no other position.

DR. J. C. A. GERSTER, New York: Dr. Howard D. Collins has devised a most ingenious and convenient traction bandage-sling for use in connection with Dr. Hawley's table. Before applying the bandage two pieces of felt ¼ inch thick and 4 inches wide are laid next to the skin. One, 6 inches long, is laid in front of the ankle over the dorsum of the tarsus; the other, 4 inches long, is laid over the Achilles tendon. The bandage is of stout Canton flannel, 3 inches wide and 2 yards long. The bandage forms two symmetrical hitches, one in each side of the ankle. Each hitch forms a Y, one limb passing in front and one behind the ankle. Traction is made by pulling on the stems of the Y's. As soon as traction is released, constriction ceases. This spontaneous relaxation of the hitches would not take place if they were so applied that they formed T's instead of Y's. By appropriate adjustment, varying the site to suit each case, the points where the limbs and stems of the Y's meet can be so placed that the subsequent traction suffices to hold the foot correctly inverted and at right angles to the leg. As soon as plaster has set the projecting stems of the Y's, by which traction is maintained, are cut off flush with the cast. The blueness of the toes from interference with the venous return, present up to this time, subsides immediately, because constriction ceases on relaxation of traction. The advantages of nail extension are many for cases in which, on account of associated trauma to skin, etc., or on account of long standing shortening, the customary plaster of paris or traction methods are unsuitable. In fractures, properly treated from the very start, nail extension will not be indicated in more than 4 to 5 per cent. of the cases.

DR. EDWIN W. RYERSON, Chicago: It is perfectly evident that many fractures of the femur can be treated as has been outlined by Dr. Peckham, but some cannot, and other treatment must be used. Dr. Albee said that we need exact doweling to secure union of bone fragments. That is desirable, without doubt; but I have a perfect case in which I took the bone-spike from the tibia and filed it nearly round with a rasp and file, without using a doweling instrument. This was a complete fracture of the neck of the femur, incurred a year previous, a so-called intracapsular fracture. Another point I wish to refer to is the use of the motor drill for making holes in the upper end of the femur. I do not think you need it. I believe that it winds up the soft tissues too much, as Dr. Allen said a year or so ago. It is better to have the drill point in a plain hand-drill, because the work is then easier and safer, and you can control the drill better in going through the bottom of the trochanter. You should not start the drill on the trochanter itself, but just below the trochanter, and go obliquely upward and inward. In one of the roentgenograms shown the bone-peg was inserted at a right angle to the shaft of the femur. This is not the way I prefer to do. I go down under the overhanging border and drill upward and inward, and this is easier with the hand-drill than with the motor-drill. I have found the use of the Hawley table very satisfactory. I think that it solves many of our problems. In a clinic where much fracture work is done, I consider it invaluable.

DR. FRANK E. PECKHAM, Providence, R. I.: I do not think that any one can succeed every time. I selected three pretty bad cases and they resulted very well. I think that the less metal we put in, the better. I would suggest as a good motto, "M. M. J."—Minimize metallic junk.

The Partnership of Genius and Labor.—Genius begins great works; labor alone finishes them.—Joseph Joubert.

Therapeutics

TRINITROTOLUENE POISONING

In the ammunition factories of Great Britain, trinitrotoluene, one of the high explosives employed, has been found to be dangerous to the health of a minority of workers coming in contact with it, and has proved fatal from toxic jaundice. The matter has become so important that the medical inspector of factories has prepared for the benefit of practitioners a paper on the chemistry of trinitrotoluene (or T. N. T., as it is designated), its method of absorption, the symptoms produced by it, the precautions to be taken against poisoning, the method of treatment, and the differential diagnosis of trinitrotoluene poisoning from that of dinitrobenzene, tetryl and lyddite, the latter a picric acid derivative.[1]

Trinitrotoluene is a high explosive obtained by nitrating toluene, from coal tar, a benzene compound in which one hydrogen atom is replaced by CH_3, and in which during the process of nitrating three other hydrogen atoms are replaced by the nitro radical, NO_2. The product is solid at ordinary temperatures and may be reduced to a fine powder, melts at 80 C., and sublimes when melted.

When the skin or hair is exposed to trinitrotoluene by contact, a characteristic yellow or tawny orange stain is produced, which is removable by oils, greases, acetone, ether, benzene and other compounds, but not by water. When trinitrotoluene is treated with alcoholic solution of potassium hydroxid, a deep pink color, changing to purple and then to brown is produced, and this reaction is employed in testing for trinitrotoluene in urine, after the latter is treated to release the trinitrotoluene from its combinations, a rather complicated procedure.

Trinitrotoluene can be absorbed to a dangerous extent by the skin, and as fine dust or as sublimate will reach the mucous membranes of the nose and mouth, or perhaps even the lungs, and may be swallowed with the secretions of the mouth, nose and throat. It may be recovered from the feces unchanged in most workers, and in many from the urine, but only in combination. Among the symptoms it produces are dermatitis, much like that produced by other irritants, increased by flushing and perspiration and by friction; gastritis, with abdominal pain, vomiting, constipation which is constant, flatulence and distention; and blood changes similar to those of dinitrobenzene poisoning, with the presence of methemoglobin, though cyanosis and breathlessness are less evident. Cell degeneration is readily produced by trinitrotoluene, and when the liver is involved toxic jaundice results, though in only a few cases. Evidence of gradual absorption is shown by pallor of the face and an ashen gray color of the lips; sometimes the lips and tongue are deeply cyanosed. Jaundice may be conjunctival or general, and often appears suddenly during the first four weeks of exposure. Liver dulness is variable, ascites is sometimes present, respiratory distress is not noticeable when the patient is in bed, and pyrexia has occasionally been observed in severe cases; but neither bradycardia nor pruritus is common. Two deaths from anemia unassociated with jaundice have been reported, with reduction of red cells to one million, of unequal size, but no poikilocytes or nucleated reds. Microscopic examination excluded pernicious anemia. Death resulted from hemolytic aplastic anemia, the blood-forming marrow having been greatly reduced.

Points of differential diagnosis are the characteristic appearance already described, the character and situation of the abdominal pain, and the presence of constipation and abdominal distention. It may be confused with other gastric disturbances, and must be distinguished from tetryl and picric acid poisoning, the former staining the skin a yellow or apricot color, the latter a canary yellow or greenish yellow; both set up a dermatitis similar to that of trinitrotoluene, but the constitutional symptoms are not pronounced, and toxic jaundice from them has not been reported.

Postmortem, the outstanding feature is atrophy of the liver, which in some cases is reduced to half the normal weight. Microscopically, the greater part of the liver tissue is found to have undergone complete destruction, associated with proliferation of fibrous tissue. The kidneys are large and icteric, the cortex bulges, the labyrinths are frequently yellow, there is engorgement of the pyramids, and cloudy swelling and fatty degeneration of the tubules.

Treatment in the absence of jaundice is simple: removal from contact, rest in bed for a day or two, a diet consisting of milk, milk puddings, fruit and green vegetables, demulcent drinks, such as barley water, tea and coffee; for the constipation, vegetable laxatives and cascara, with a mixture containing sodium sulphate, potassium citrate and sodium bicarbonate as a routine measure. In jaundice cases, absolute rest in bed is essential; milk diet, small in quantity at first, gradually increasing to 4 pints a day; the bowels must be kept loose, preferably by mistura alba (a mixture containing magnesium carbonate, magnesium sulphate and peppermint water) repeatedly given. In jaundice with marked toxic symptoms the prognosis is grave. Alkali-producing drugs, such as the citrates and bicarbonates, should be given to overcome the tendency to acid intoxication. Rectal and intravenous saline injections have a place in the treatment of severe cases.

1. Trinitrotoluene Poisoning, Med. Press and Circular, 1916, n. s., 102, 534.

DISTURBANCES OF THE KIDNEYS

(*Continued from page 372*)

NEPHRITIS

CLASSIFICATION

Were it possible absolutely to accept Fischer's theory of nephritis, namely, that an overproduction of acid in the body or an accumulation of acid in the kidneys is the usual cause of this condition, many complex problems connected with it would become simple. If, as he believes, it were true that the edema is due to too much acid in the system, and that most of the uremic symptoms are due to cerebral edema, our understanding of the pathology and the treatment of these conditions would be clearer; but, unfortunately, the treatment which he sometimes recommends to overcome the supposed excess of acid may be hazardous. Water, as he states, is undoubtedly the best diuretic; but it cannot be accepted that no other substances cause diuresis. Carbohydrates in diabetics act as diuretics, while a number of drugs will cause diuresis in normal conditions of the kidney.

Perhaps the best classification of nephritis is that offered by Oertel:[69]

69. Oertel, Horst: The Classification of Nephritis, Arch. Int. Med., June, 1913, p. 653.

1. Simple nephritis.
2. Degenerative and exudative nephritis.
3. Degenerative and productive nephritis.
4. Productive nephritis.
   (*a*) Diffuse.
   (*b*) Focal and patchy.
5. Senile atrophy or nephritis due to arteriosclerosis of the kidney. Senile kidney.

1. The first class of nephritis is accompanied by all the classic symptoms of inflammation with exudate and with desquamation and proliferation of parenchyma cells in some cases. Recovery may be complete.

2. The second class shows degeneration and necrosis exudate with hemorrhage, proliferation of parenchyma cells and formation of casts in abundance.

3. The third class shows not only degeneration and most of the signs and conditions of the second class, but also a production of fibrous tissue and shrinking of structure, with thickening of the renal arteries.

4. The fourth class is identified by the development of new kidney-secreting structure.

In the diffuse type of inflammation not only is new tissue formed, but also there is a growth of connective tissue and distortion of the tubules.

In the focal form, hyaline swelling and fatty degeneration occur in the intima of the small renal vessels, causing impaired function of the parts of the kidney fed by these blood vessels, or, in extreme cases, actual obliteration, marked by a granular appearance of the kidney.

5. The fifth class or arteriosclerotic kidney consists of a noninflammatory degeneration.

While the foregoing classification is based on pathologic findings and may be difficult to interpret clinically, it is scientific and recognizes the well known interlocking and overlapping cases of nephritis. An exact diagnosis of the pathology of a kidney cannot be made by the urinary or blood findings; we can determine the signs and symptoms and the amount of excretion and retention only at a particular date and hour. Frequently we cannot accurately prognose the length of life of the patient, even when he is moribund.

The old classification of parenchymatous and interstitial nephritis is not sufficient. Most parenchymatous nephritis would probably be more aptly termed diffuse nephritis. Probably no interstitial nephritis occurs without more or less parenchymatous degeneration, if not inflammation. Possibly the senile sclerotic kidney may be termed more or less purely interstitial. We may recognize the factors which tend to produce acute or chronic inflammation of the kidneys, and the factors which are most likely to cause a parenchymatous and diffuse or interstitial type.

ETIOLOGY

The facts that albumin and casts are frequently found in the urine in various ailments, and that in incipient and advanced nephritis acute disturbances of the kidneys frequently occur have not been better demonstrated than by the findings of Brown and Cummins[70] in the cases of 7,000 patients admitted to the San Francisco Hospital, the majority of whom were men between the ages of 20 and 60. They found albumin and casts in 594 patients, although only thirty-eight of these were admitted for nephritis. They found that venereal infections, the more serious general infections and alcohol played a prominent part in the previous history of chronic nephritis. They draw the logical conclusion that a kidney once injured is later more susceptible to irritations.

Localized nephritis is known to be caused by bacteria from some acute infection, pyemic in type, as with infarcts, or by a more chronic localization, as in tuberculosis. Localized or general nephritis may be caused by some hidden chronic infection, as mouth or nose infections; or a more or less acute nephritis may be the result of an acute general infection, such as scarlet fever, diphtheria, pneumonia, cerebrospinal fever or smallpox. All the above mentioned infections ordinarily are the sources of diffuse nephritis, perhaps primarily parenchymatous.

Doubtless if the urine should be examined during the first stage of every acute infection, traces of albumin would frequently be found. The backache and high fever accompanying these infections is probably due to kidney congestion, caused by toxins of the bacteria, or by the disturbance of metabolism, especially protein. Probably, in the more simple general infections, the bacteria rarely reach or disturb the kidneys, but their toxins may affect these organs.

In lead poisoning, in syphilis, in prolonged cardiac insufficiency, in hypertension, in arteriosclerosis and in gout, although the nephritis may be more or less profuse, the interstitial form usually predominates. Prolonged intestinal disturbances, liver insufficiency, repeated strenuous physical labor, and polyglandular (ductless gland) disturbances are apt to cause chronic disturbance and chronic inflammation of the kidneys. Prolonged and repeated kidney congestion, due not only to cardiac insufficiency, but also to pressure from some abdominal cause, or to displacement of a kidney, tends to cause one or both kidneys to become infected with chronic inflammation. Probably abdominal pressure during pregnancy is a frequent cause of this type of nephritis.

The composition of the blood coming to the kidneys represents an important factor in the health of the kidney glands. The chief facts to be considered in this respect are: whether the blood contains the necessary nutriment; whether it carries elements causing dilatation or contraction of the kidney vessels; whether it carries an extra amount of waste products, drugs or foreign matter difficult of excretion or hard to metabolize or to change chemically into normal excretory products; whether the bulk of the blood coming to the kidneys is too great for the kidney structure to care for properly, or whether the amount of blood is insufficient to cause a proper kidney pressure both for nutrition and for excretion, making the kidney function normal. As stated, metabolic, organic or bacterial toxins may irritate or erode the kidney cells and sooner or later cause nephritis.

There doubtless is also a nervous control of the kidney circulation and of the kidney activity that at times plays an important part in an acute or chronic disturbance of the kidneys. Surgical conditions in the abdomen may reflexly interfere with the kidney function, making kidney tests inaccurate; this is especially true of ureteral, bladder and pelvic disturbances. Furthermore, disturbances of many glands, such as the liver, thyroid, suprarenals and pituitary, markedly change the work required of the kidneys.

As abnormal, repeated heart strain injures the heart and blood vessels, so repeated overmuscular effort, by increasing the exertion of the kidneys, may injure them.

Toxins or irritants absorbed from the intestine or from poisonous foods, cold storage foods, canned

70. Brown, P. K., and Cummins, W. T.: A Study of the Etiology of Chronic Nephritis, THE JOURNAL A. M. A., March 11, 1916, p. 793.

foods, or foods containing minute doses of boric acid or sodium borate may, by daily irritation, cause chronic nephritis. Chemical irritants such as turpentines, phenols and many aromatic oils or synthetic drugs, under certain conditions, may cause inflammation of the kidney. Too great an absorption of silver nitrate may cause acute nephritis, while prolonged use of mercury and arsenic may cause an acute or chronic form of this disease. Chloroform and ether may cause temporary kidney irritation.

The kidneys generally respond to an increased demand on them by a dilatation of their vessels with an increased general blood pressure. Following the ingestion of large amounts of protein or the circulation of irritants in the blood, an increased amount of blood flows through the kidneys in a given time and the excretion of urinary substances is increased; thus the blood is purified. The person who is repeatedly poisoned continues for months in apparent health, entirely unaware of the slowly developing chronic changes taking place in his kidneys. There comes, however, a day of reckoning; the kidneys, heart and blood vessels gradually work less harmoniously, and the kidney congestions result in chronic nephritis.

If the close relation of the kidneys to the skin, relative to excretions is considered, many unexplained albuminurias and attacks of nephritis will be understood. The excretion of solids by the skin is increased in this disease, although the total excretion is small.

While acute nephritis caused by cold alone is probably very rare, it may be the exciting cause of an already existing subacute or chronic disturbance. Chilling of the body at any time increases kidney activity, while warming of the body decreases it.

Any disease of the skin which prevents normal perspiration is detrimental to the kidneys, whether caused by burning, erysipelas, scarlet fever, dermatitis exfoliativa, or by any other acute or chronic general inflammation of the skin. The larger the area of skin affected, and the greater the inability to excrete water, the greater is the danger which threatens the kidneys. The reverse is also true: in chronic nephritis the immediate prognosis is more favorable when the skin is soft, moist and healthy, but is less favorable when the skin is dry and harsh.

Ether and chloroform anesthesia, especially the latter, which always causes kidney disturbance, by repeated use become a positive menace to the kidneys.

Diabetes may be a causative factor in nephritis, as frequently excessive amounts of nitrogenous food are consumed. Syphilis may also be an etiologic factor, either per se or through the arsenic or mercury treatment employed to cure it.

Chronic alcoholism is perhaps an indirect cause of nephritis since it disturbs the circulation, the liver and the digestion. Tobacco, by causing an abnormal blood pressure which finally injures the heart, becomes an indirect cause of nephritis.

The recuperative power of the kidneys and the harmless nature of occasional urinary symptoms of nephritis must, however, be recognized. Hence, extreme care should be used in diagnosing a case of nephritis. When a case is thus diagnosed it should be remembered that if one fourth of the kidney structure is healthy, this is sufficient to prevent serious symptoms. Furthermore, diseased parts may recover, or even if hopelessly degenerated, neighboring parts of the kidney may hypertrophy and carry on the extra work.

To sum up, heart and blood vessel insufficiency is a common forerunner of inflammation. This congestion may be the result of lordosis, or of a floating kidney. Prolonged exertion and hard work is a common cause of congestion and albuminuria, as is also profuse sweating, which increases the viscosity of the blood by dilating the kidney vessels.[71]

Prolonged low blood pressure and a reclining position associated with serious illnesses, such as typhoid fever and tuberculosis, are detrimental to the kidneys, resulting in extended passive congestion. Hence, the patient's position in bed should be changed frequently, just as soon as he is able to endure it.

Albuminuria, which frequently follows operations, may be due to the anesthetic, to an abnormal position long retained, such as that in pelvic operations, or to the two combined. Hence, anesthesia and abnormal positions on the operating table should be of as short duration as is compatible with efficiency and accuracy of technic.

An important fact to bear in mind is that one attack of nephritis apparently breaks down the resistance of the kidneys, and that frequent attacks of albuminuria, which is generally caused by renal congestion, leaves them susceptible to real nephritis.

(To be continued)

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION. W. A. PUCKNER, SECRETARY.

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Prepared by Western Chemical Company, Inc., Hutchinson, Minn.

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(Accepted for inclusion with the appendix to New and Nonofficial Remedies.)
Prepared by Western Chemical Company, Inc., Hutchinson, Minn.

71. Sollmann: Am. Jour. Physiol., 1905, **13**, 24.

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SATURDAY, FEBRUARY 10, 1917

THE EARLY DIAGNOSIS OF WHOOPING COUGH BY CULTURAL METHODS

The statement is frequently made that not enough is being done to control and reduce the spread of whooping cough. Thus Morse[1] has recently voiced a strong demand for increasing efforts in this direction, and he urges an educational campaign to convince physicians and the general public of the seriousness of whooping cough and of the necessity of a much stricter enforcement of notification and isolation than is now practiced. It is accepted that the disease is caused by a small bacillus, discovered by Bordet and Gengou, which is transferred in the sputum from the sick to the well. This bacillus is probably present in the respiratory tract from the earliest moment of infection, and it is demonstrable in the sputum long before the diagnosis of whooping cough can be made from the symptoms.

In order to reduce the chances for spreading pertussis, the disease must be recognized much earlier than is now the rule, and the patients properly isolated while they are still in the catarrhal stage when, in fact, they are the most infectious. In the early stages of the disease there are not available any easy short cuts to diagnosis by way of immunity reactions because the complement-fixing and other immune substances have not yet developed sufficiently. The whooping cough bacillus is hardly distinguishable from the influenza bacillus on direct microscopic examination. The only remaining method now known by means of which a definite diagnosis can be made in the early stages of whooping cough is the isolation of the bacillus from the sputum by cultural methods. Morse apparently recognizes that this is quite true, but dismisses the method as too difficult and complicated for practical purposes, a conclusion from which one might well differ because the technical procedures are certainly no more difficult and no more complicated than many now in daily use for practical ends.

Chievitz and Meyer[2] in Copenhagen have been studying the sputum in whooping cough by cultural methods. They find the bacillus present in practically all cases when the catarrhal stage is well established. In making the cultures it is necessary to fish out mucopurulent flocculi from the last portion of the expectorate, to wash them in sterile salt solutions, and rub them over the surface of the medium (blood-potato-agar). The characteristic colonies resemble minute drops of mercury — polished and glistening — and appear after an incubation of about four days. The final step is agglutination of the bacilli in the colonies by the serum of rabbits or horses immunized with *Bacillus pertussis*. In very small children or when there is no sputum the Danish workers obtain good results by making the patients cough against plates of culture medium held a few inches away from the mouth. This simple way is of value especially at the very beginning of the infection. When the attack has lasted about four weeks or so, cultures are usually no longer obtainable, and the Danish regulations now permit release from quarantine after four weeks and two negative cultures.

It appears, then, that we have it in our power to secure the benefits which would result from the diagnosis of whooping cough earlier than can be made from the symptoms alone. To repeat, the cultural diagnosis of whooping cough in the early stages, when it is most infectious and isolation would accomplish the most, does not appear to be so inherently difficult as to be really impracticable. Arrangements should be made for the introduction and use of this early diagnosis by culture because thereby sickness can be prevented and life saved.

1. Morse, J. L.: Whooping Cough: the Measures to be Taken for Its Control and Prevention, Boston Med. and Surg. Jour., 1916, **175**, 723.
2. Chievitz and Meyer: Ann. de l'Inst. Pasteur, 1916, **30**, 503.

NOCTURIA

The efficiency of the functions of different parts of the alimentary tract have long been studied experimentally and for purely diagnostic purposes by the use of test meals and test diets. It has lately been proposed to investigate somewhat similarly the presence or absence of impairment of renal function, both qualitatively and quantitatively, by the employment of a "nephritic test meal." The application of this idea, the clinical development of which we owe primarily to Hedinger and Schlayer,[1] has recently been carried out extensively by Mosenthal.[2] It has been ascertained that the nephritic test meal, when duplicated on the same patient, yields identical results, provided the clinical condition has not changed. As selected by Mosenthal, the dietary contains approximately 13.4 gm. of nitrogen, 8.5 gm. of salt, 1,760 c.c. of fluid, and a considerable quantity of purin material in the form of meat, soup, tea and coffee.

The most important findings in the urine of healthy persons on the nephritic test meal are exemplified in

1. Hedinger and Schlayer: Deutsch. Arch. f. klin. Med., 1914, **114**, 120.
2. Mosenthal, H. O.: Renal Function as Measured by the Elimination of Fluids, Salt and Nitrogen, and the Specific Gravity of the Urine, Arch. Int. Med., November, 1915, p. 733.

the differences between the day and night urines. Whatever the quantity of urine excreted during the day by such normal persons, it is found that the night specimen varies within very narrow limits. It is high in specific gravity (1.016, but usually 1.018 or higher), high in its concentration of nitrogen (above 1 per cent.), and small in volume (400 c.c. or less), regardless of the quantity of fluid ingested or the amount of urine secreted during the day period.

Nocturnal polyuria, or nocturia, on the other hand, is one of the earliest symptoms of renal disease, according to Mosenthal. By this is not meant a frequent voiding of urine — a "nocturnal pollakiuria" — not accompanied by an increase in the total usual volume of 400 c.c., but rather an increased volume of night urine. True nocturia may be found when few other signs of nephritis are detectable. The specific gravity and the nitrogen concentration of the night urine are lowered as soon as the kidney function becomes involved. When the nephritis becomes severe and chronic, an advanced degree of functional inadequacy of the kidney is indicated by a markedly fixed and low specific gravity, a diminished output of both salt and nitrogen, a tendency to polyuria, and a night urine showing an increased volume, low specific gravity and low concentration of nitrogen. Such functional pictures, we are told by Mosenthal, are not confined to nephritis. Diminished renal function is present, however, and its cause must be sought for in many directions — the urinary passages, the blood, or the kidney itself.

The fundamental features of the ominous nocturia also apply to other conditions than those established by this special nephritic test diet. Addis and Watanabe[3] have recently collected numerous data in regard to the volume of urine of persons on a constant water intake. They find that the volume of urine in normal persons on a constant diet with the same water intake is extremely variable for any single day or part of a day. The average volume of the last three days of the diet when the water intake was 2,070 c.c. varied in twenty individuals from 1,013 to 1,712 c.c. for a twenty-four hour period, from 684 to 1,195 c.c. for the first twelve hours of the day, and from 501 to 788 c.c. for the first eight hours of the day. The percentage of the twenty-four hour volume excreted during the twelve hours of the night did not exceed 47 per cent. in any subject, when the volumes for the last three days of the diet were averaged. When the kidneys are diseased, however, the volume of urine passed at night is often larger than the day urine.

These studies are of particular value in furnishing criteria for what constitutes a true nocturia, that is, an abnormally high proportion of night urine. With this established by some dependable method, the existence of renal imperfection may be suspected even when other signs more familiar have not made their appearance. As in so many other departments of medical practice, here, too, absolute rules applicable to every case cannot be laid down. There are too many complicating variables in the human physiologic mechanism to permit the application of hard and fast directions. Christian[4] has noted that in patients with pernicious anemia the disease is accompanied by a disturbance of renal function, as measured by renal dietary tests, which is similar to that found in patients with advanced chronic nephritis. In these patients there is no evidence of chronic nephritis, and the disturbance appears to be due to the anemia, decreasing with the subsidence of the severity of the anemia unless this is maintained so long that a permanent disturbance of renal function ensues. Christian properly points out that caution is required in the interpretation of the results of such tests in patients supposed to have nephritis. For, he states, if a patient with moderate nephritis, as indicated by other tests and by symptoms, happened to have a fairly severe anemia, the latter factor might give to the picture of renal excretion a fixation suggestive of advanced nephritis, and lead to a prognostic interpretation which was unjustifiably poor. Consequently, it will be well to consider the element of anemia when drawing conclusions from dietary renal tests applied to patients with nephritis, though it is not probable that this will prove a complicating factor in many cases, for usually the degree of anemia in patients with nephritis is slight — much less than their pallor would suggest.

3. Addis, T., and Watanabe, C. K.: The Volume of Urine in Young Healthy Adults on a Constant Diet, Jour. Biol. Chem., 1916, **27**, 267.

4. Christian, H. A.: Renal Function in Pernicious Anemia as Determined by Dietary Renal Tests, Arch. Int. Med., October, 1916, p. 429.

THE VENEREAL DISEASE PROBLEM—II

Recommendations of the British Royal Commission on Venereal Diseases

Among the topics considered by the comprehensive report of the Royal Commission on Venereal Diseases[1] are the prevalence and distribution of the venereal diseases, the unreliability of statistics as shown by death registration, the effects of the venereal diseases on those primarily infected and on their offspring, and the economic effects of the venereal diseases. On the question of notification the commision reports adversely, saying:

> We think it clear . . . that if a case for notification of venereal diseases is to be established it must be based upon the assistance which notification would afford to the treatment of the individual, and the consequent protection of the community, and not on the ground that it would facilitate general preventive measures. . . . The main objection which has been urged against notification of venereal diseases is that it would actually do more harm by deterring people from seeking treatment, and by driving them more than ever into the hands of unqualified persons.

The commission believes it possible that the situation may change after the general measures for treat-

1. The Venereal Disease Problem—I, editorial, THE JOURNAL A. M. A., Feb. 3, 1917, p. 375.

ment which it has recommended have been for some time in effect, and after the public has been educated in the venereal diseases, but it does not regard notification as now practicable. It thinks that anonymous notification would not be satisfactory. The report lays stress on the need for increased attention to the venereal diseases in the scheme of medical education. It urges the necessity for opportunity for special study of the venereal diseases, and suggests that one of the functions of the clinics for venereal diseases which it recommends shall be the affording of opportunities for study to medical students and practitioners. The commission believes it is important that every effort should be made to enlighten the public as to the seriousness and the contagious dangers of the venereal diseases and their distressing after-effects, and that there should be a franker attitude toward these diseases. It holds that children under 14 are unfitted for this instruction. To older children it recommends such instruction, but points out the difficulties and the objectionable character of many well intentioned books and pamphlets which have been issued on the subject. It considers that no such publications should be countenanced by educational authorities unless they bear authoritative endorsement. In the case of England it recommends that such publications should have the endorsement of the National Council for Combating Venereal Diseases. The commission gives its endorsement to the various organizations which have been formed for promoting the welfare of youth, for teaching sexual morality and for developing character, and adds, "The fact that we recommend that free treatment should be provided for all sufferers makes it, in our opinion, all the more necessary that the youth should be taught that to lead a chaste life is the only certain way to avoid infection."

The main emphasis of the report is placed on the necessity for early and accurate diagnosis and for early and continuous treatment. The commission finds that present opportunities for diagnosis and treatment are entirely unequal to the needs of the situation. In recommending improvement in the facilities for treatment it considers that existing institutions should be utilized as far as possible, that new institutions should be founded only when it is unavoidable, and that the new clinics should be part of general hospitals, and not stigmatized by being devoted to venereal diseases alone. It is convinced that existing hospital facilities, with necessary extensions in certain localities, would furnish all of the institutional needs of the situation, but it believes that no adequate system of treatment is possible unless responsibility for it is assumed by the state. The institutions provided must be available for the whole community. To that end they should be made accessible, and evening clinics should be provided. They should be free from embarrassing restrictions. Patients should be given treatment regardless of their residence, and should be free to go to clinics outside of their own district. Persons able to pay should, if possible, be sent to their physicians, but even they should not be refused treatment in the public institutions if they are unwilling to go to a private physician. It is pointed out that treatment to be effective in controlling the public dangers of the venereal diseases must be continued until a cure, or freedom from infectiousness is attained, and that effective provisions must be made for seeing that treatment is continued through the infectious period. Compulsory treatment is suggested for the delinquent.

The commission believes that any government scheme which is carried into effect must rely largely on the education and the cooperation of the medical profession, and must depend in the end for its success on the general practitioner, who constitutes "the first line of defense in the community." The report emphasizes strongly the great damage which is done in the treatment of venereal diseases by unqualified practitioners; by drug store prescribing, by quacks and, as well, by less vicious but ignorant practitioners of special sects; and strict measures to prevent such treatment are recommended. The commission believes that all advertising of remedies for venereal diseases should be prohibited by law.

Readers who have noted the first steps in this campaign will realize that the commission has done its work well. On many hotly debated questions it has offered a judicial, conservative opinion. Its findings are not purely local, but show a consideration and a broad grasp of human nature, economic conditions and social problems that could be held only by so representatively constituted a body as this commission was.

THE PROBLEM OF KIDNEY FATIGUE

In physiology and medicine, as in other sciences, the introduction of new methods of observation and experiment usually leads to new facts which may necessitate a revision of our older theories. In former days some of the intellectual disciplines advanced almost solely by the single method of accumulating new data. The older natural history thus at first contented itself largely with the description of more and more species. At length, however, there came a time when the storehouse of observations had to be inventoried, and its contents arranged in some orderly fashion. The procedure of taking stock of the known always raises questions which carry us into the field of the unknown.

The study of the distribution of the so-called waste products of the body, made possible by improved chemical methods of blood and tissue analysis, has been fruitful in enlarging the horizon of our knowledge. Urea, creatinin, uric acid and other familiar urinary components can now be followed back farther on their path from the threshold of formation in the metabolic transactions of the organism. It is not so

long ago since the failure of these substances at times to appear in the urine in expected amounts gave rise to the conclusion that, owing to some renal insufficiency, they were being accumulated in the blood itself. Retention and uremia were satisfactory expressions to account for a diversity of pathologic symptoms in which defective kidney function was believed to play a part. Today we can advance beyond the stage of mere guesswork in many of these cases. Renal function can be tested quite accurately in a number of ways; furthermore, the blood can be examined, without any serious technical obstacles, for the suspected evidences of unexcreted waste products.

Apparently unlike responses of the kidneys to tasks of excretion imposed on them experimentally by investigators have led to the assertion of the existence of what might be called "kidney fatigue."[1] This idea is somewhat in harmony with the observed fatigue or temporary exhaustion of other glandular structures, such as the pancreas and salivary glands, in which the outpouring of some specifically accumulated product is assumed to entail time for its replacement by cellular synthesis.

It is by no means so certain, however, that an equally active and immediate part in the work of urine formation is played by the kidney cells. Without denying their physiologic cooperation, it must be admitted that physical and physicochemical processes serve to promote no small portion of the renal performance. So far as such changes are concerned, there is little occasion to expect any signs of fatigue. This is in accord with the belief of Ambard that the kidney manifests no intrinsic variability in function. He maintains that if the concentration in the blood and in the urine of the substance excreted is known, the action of the normal kidney may always be predicted with mathematical accuracy. According to Ambard there exists, for any person, a constant relation between the concentration of urea in the blood and its excretion in the urine. A study of Ambard's "constant" under conditions of extreme variation of functional demands may therefore be expected to give evidence for or against the existence of renal fatigue.

The work of Schlayer and others on water and chlorid excretion by the kidneys has been interpreted as indicative of a wide variability in kidney action even under the same conditions. Addis and Watanabe[2] have approached the debated question by a study of the rate of excretion of urea administered to young healthy adults who were on a constant diet carried through in order to obtain detailed information as to the range of variation in the function of the normal kidney under uniform conditions. In a large number of experiments on such persons, they found no evidence of variability in kidney action in the work of excreting preformed urea added to a constant diet. Such variation as was found in the amounts of urea excreted could be fully accounted for as arising from extrarenal factors. It is concluded, therefore, that the normal kidney under constant conditions is characterized by the possession of a high degree of constancy of function. The rate of excretion of the administered urea during successive periods of the twenty-four hours showed that the repetition of large doses of urea did not elicit the condition which has been described as "kidney fatigue." A fraction of the urea which was administered remained in the body after twenty-four hours. This urea was not retained because of any failure on the part of the kidneys to eliminate it, for the amount retained was no larger when 40 than when 20 gm. of urea were taken.

In connection with these experiments it should be recalled that administered urea is not accumulated in the blood alone, but exists, as Marshall and Davis[3] have shown, for the greater part distributed to the tissues, from which it is gradually withdrawn for excretion by the kidneys. Indeed, the major part of ingested urea soon enters the tissues, so that its concentration in certain organs is approximately equal to its concentration in the blood. The tissue reservoir, so to speak, for the storage of large quantities of urea temporarily present in the body has not been known until quite recently. It serves most advantageously as a regulatory factor to avert undue concentration of urea at any moment in any particular locality. Retention of this substance may accordingly be possible because it is never brought to the kidneys for excretion. But even when exceptionally great loads are imposed on the kidneys, as occurred in the successive increase in urea-eliminating demands over several days in the experiments of Addis and Watanabe, the existence of a condition approximating fatigue of these organs could not be detected.

1. Lindemann, W.: Die Funktionen der Niere, Ergebn. d. Physiol., 1914, **14**, 652.
2. Addis, T., and Watanabe, C. K.: The Rate of Urea Excretion, II, The Rate of Excretion of Administered Urea in Young Healthy Adults on a Constant Diet, Jour. Biol. Chem., 1916, **27**, 249.
3. Marshall, E. K., Jr., and Davis, D. M.: Urea: Its Distribution in and Elimination from the Body, Jour. Biol. Chem., 1914, **18**, 53. The Distribution of Urea in the Body, editorial, THE JOURNAL A. M. A., Sept. 26, 1914, p. 1115.

EPIDEMICS OF TYPHOID FROM WATER SUPPLY

A number of typhoid epidemics have been reported in this country which have been due to the contamination of a good public water supply with water drawn privately from an auxiliary source, i. e., bad water has been mixed with good in a double system of connected pipes. The purpose of the dual system of water piping in its origin was largely economical. It has been the policy of fire insurance and underwriter companies to require of their industrial risks the instalment and maintenance of two systems of fire service, one from the public water supply, the other from an independent source. The aim of this require-

ment is to afford additional fire protection by automatic sprinklers and the like in case either system is put temporarily out of commission. In many parts of the United States such a double system of water piping in factories has existed for more than twenty-five years. It is natural, perhaps, that in most instances little attention should be paid to the sanitary quality of the secondary private supply, designed only for emergency use, and that this supply should be obtained as a rule from the most convenient source, often a highly polluted stream on which the factory is situated. The necessity for the separation of the two systems, however, appears to have been generally recognized, but it was for a long time supposed that the mixing of the waters could be prevented by check valves which were placed in the piping system.

One of the first events to shatter confidence in the efficiency of the check valves was a typhoid outbreak in Lowell, Mass., in the summer of 1903. What happened at that time is told in the report of the Lowell Water Board:

> On Saturday, July 18, there occurred a fire on the Merrimack Corporation, at which the Locks and Canals' reservoir was drawn upon to such an extent that the pressure in their pipes went below the city pressure. Consequently, the check valves between the two system opened, and the city water flowed into the Locks and Canals' pipes until the fire was extinguished. Some time after the Locks and Canals Company started pumping, it was found that their reservoir did not fill, and on investigation it was found that a check valve situated on the Massachusetts Corporation near the corner of Canal and Bridge streets had failed to close, and water from the Locks and Canals was flowing into the city mains. Within a few days an epidemic of sickness appeared resembling cholera morbus, and later developed many cases of typhoid fever.

It seems now to be generally admitted by engineers that even modern check valves are not to be depended on. In the Lowell case the check valve was made especially for the Locks and Canals Company, was said to be substantial and well constructed, and had been found in supposedly good working condition one week previous to the fire. The general reliability of check valves is apparently not very high. One water works superintendent expresses his opinion feelingly: "Any one who has ever had much experience with check valves knows that they are an invention of the devil."

Outbreaks of water-borne typhoid caused by the dual water pipe system are far too common. They have been reported among other places at Winnipeg and Toronto, at Omaha, at Circleville, Springfield and Van Wert, Ohio, and have been suspected in many other localities. In Philadelphia, in 1913, numerous typhoid cases developed in a section of the city supplied with the excellent public water from the Torresdale filtration plant, at the same time that other parts of the city supplied from the same source were typhoid free. Bacterial examination of the tap water in the affected district gave evidence of contamination. Inspection of manufacturing establishments along the Delaware River water front disclosed the existence of a number of factories having dual connections with the polluted river water. When complete severance of the filtered water supply from the private source was enforced, typhoid diminution followed.

One of the most recent epidemics attributed to this cause occurred in September, 1916, at Elgin, Ill., where the employees of a large watch factory suffered severely. This disastrous outbreak has had an especially instructive sequel since under the Illinois Compensation Act the death claims — eighteen in number — against the watch company have been settled through the agency of the State Industrial Board. The action of the manufacturing corporation seems to have been exemplary since the very onset of the epidemic; not only have the death settlements been adjudicated with the complete cooperation of the factory officials, but also during the progress of the epidemic the medical and hospital responsibility and expenses were promptly assumed by the watch company. It is estimated that the actual outlay by the manufacturer in behalf of the typhoid sufferers will be approximately $100,000.

There is little doubt that typhoid cases which can be traced directly to the drinking water furnished by an employer come properly within the provisions of such laws as the Illinois Compensation Act. In such cases it can be reasonably maintained that the employee is subjected to a risk "peculiar to the employment and not common to the neighborhood." A significant problem is raised for manufacturers if the drinking of infected water furnished by the employer can be made one of the causes of injury or death for which the employer must pay compensation.

There seems today sufficient reason for demanding that under no circumstances shall a connection be permitted between the pipes of a public water supply and a polluted source. Complete and absolute separation of the private and public pipes must be insisted on. It should not be difficult to solve the problems of adequate fire protection and industrial convenience without jeopardizing the public health. This matter may well receive more consideration from health authorities and other public officials than is given it at present. We are not aware that the sanitary quality of a factory water supply is given adequate attention by factory inspectors. Experience has shown, however, that the private water supply of an industrial establishment is too often the cause of preventable illness and death, and is a health hazard to which searching attention should be given. Health officials and factory inspectors everywhere should ferret out these dual water connections and summarily eliminate them.

A Motto for a Pathologic Amphitheater.—The dissecting room at Toulouse is decorated with an inscription which would be singularly apt for a necropsy theater: *Hic locus est ubi mors gaudet succurrere vitae.* "This is the place where death delights to help life."

Current Comment

THE OUTPUT OF CALCIUM AND MAGNESIUM IN MAN

It can scarcely be doubted that chemical pathology has many chapters in which perversions of the metabolism of the alkali earths, calcium and magnesium, are concerned in some degree. The rôle of these elements in the living body is hardly known in even its most superficial aspects; and whether we happen to have in mind the bones and their development, the blood, the endocrine glands, the nervous tissues, or some other structure, in each case calcium or magnesium are as yet mere incidents in the story of some interesting phenomenon. Whether an undue proportion in which they chance to be found is the result or the underlying cause or merely an unrelated incident in the problem under investigation is rarely ascertainable. Calcium and magnesium enter the body with the food and leave it with the excreta. The paths of excretion are diverse, but we scarcely know the details of even a single feature of the transit of these two important mineral nutrients through the organism. A recent writer[1] was well justified, therefore, in saying that it would be fortunate if calcium metabolism would receive as much attention as basal metabolism has lately received. It seems axiomatic also that, if we would know more about such diseases as osteomalacia, rickets, osteoporosis and infantilism, we must first have forthcoming sufficient data on the normal behavior of the body with which to compare the findings in these pathologic states. It is not always realized to what a large extent calcium leaves the body with the feces. The average daily urinary and fecal output of calcium calculated as oxid over periods of five days for five apparently normal persons, ranging in age from 13 to 70 years, was:

Urinary excretion	0.175 to 0.619 gm. of CaO
Fecal excretion	0.413 to 0.801 gm. of CaO
Total daily excretion	0.588 to 1.420 gm. of CaO

The predominant belief that the output of calcium exceeds that of magnesium in the urine appears to need revision. According to Nelson and Burns,[2] who examined twenty-five apparently healthy persons living on a mixed diet, in seventeen the daily output of calcium was larger than that of magnesium, and in eight, the magnesium predominated over calcium. The largest amount of calcium (calculated as oxid) excreted in one day was 0.488 gm.; of magnesium (calculated as oxid), 0.416 gm. The smallest amount of calcium was 0.099 gm.; of magnesium, 0.118 gm. Either calcium or magnesium may therefore be excreted in the larger amount in the healthy person. The preponderance of one element is as indicative of normal behavior as the other. Furthermore, the results indicate that each person exhibits a constant behavior as to whether calcium or magnesium shall be greater in amount in the urine voided. In the case of the three persons examined over the five day periods, of nineteen determinations only two showed a daily output of calcium exceeding that of magnesium. Such statistical facts are the beginnings of what ought to become in the not too distant future a comprehensive investigation of the metabolism of the mineral nutrients.

1. Nelson, C. F., and Williams, J. L.: The Urinary and Fecal Output of Calcium in Normal Men, Together with Observations on the Hydrogen Ion Concentration of Urine and Feces, Jour. Biol. Chem., 1916, **28**, 231.
2. Nelson, C. F., and Burns, W. E.: The Calcium and Magnesium Content of Normal Urine, Jour. Biol. Chem., 1916, **28**, 237.

MEDICAL PREPAREDNESS

While the severance of diplomatic relations with Germany does not necessarily mean war, it unquestionably brings us, as a nation, to a point at which a state of war with a European nation must be considered as a possibility. As usual in times of general excitement, many of our newspapers are filled with rumors, as many of our citizens are filled with hysteria. In emergencies, physicians, of all men, are expected to keep cool and to be able to act efficiently. This is a duty of the profession as a whole, as well as of individuals. If war comes, the rôle of the medical profession will be an important and responsible one. That these responsibilities will be assumed without hesitation and borne with credit is beyond question. In case of conflict with the Central Powers, it is difficult to see, under present conditions, how land forces could be employed, at least in the near future. Service would probably be limited to work on shipboard. For this, the Bureau of Medicine and Surgery of the Navy has its regular corps, as well as the Navy Medical Reserve. Whatever may be the outcome of the present situation, the medical profession, and especially the younger men, should understand that the Army Medical Corps needs more men and that the navy is anxious to secure additional medical officers. Those physicians not needed or adapted to regular military service should at least affiliate themselves definitely with the national Red Cross, through its various local branches, and prepare themselves, either now or for the future, to be of service.

THE RESPONSE OF A SINGLE KIDNEY TO EXCRETORY STRAIN

The capacity of one of various paired organs, notably the kidneys, to execute satisfactorily the functions which are ordinarily shared by the two organs has often been demonstrated. One eye, one lung or one kidney frequently fills suitably the ordinary needs of the individual deprived of the other organ. After ligation of one ureter, or extirpation of one kidney, the remaining kidney occasionally functions even more efficiently than both kidneys before the operation. Under extraordinary needs, however, the limit of working capacity most readily manifests itself. Addis and Watanabe,[1] taking a somewhat arbitrary index of functional capacity, have demonstrated this ability anew. The work the kidney was called on to do in their experiments was represented by the urea in the blood. The work it did was evidenced by the urea in the urine. Renal capacity was represented by the ratio between the work done and the work to be done. This was studied before and after ligation of one ureter whereby one kidney was excluded from participa-

1. Addis, T., and Watanabe, C. K.: A Method for the Measurement of the Urea-Excreting Function of the Kidneys, Jour. Biol. Chem., 1916, **28**, 251.

tion in the excretory process. Extra renal work was supplied by injections of urea into the subject. When no urea was given there was no decrease in the renal capacity because of the extirpation. The added strain was within the capacity of the remaining kidney. When the work to be done was greatly increased by the injection of urea, however, the strain which before operation had stimulated both kidneys to greater efficiency was too much for the remaining kidney; its maximal rate of work was less than the rate of increase in the work to be done, and there was a consequent decrease in the ratio. This outcome, they point out, illustrates an important principle in the measurement of kidney function. It shows that function may be entirely normal under ordinary conditions, and yet not so under strain. The administration of a large quantity of urea before the renal capacity is determined not only has the advantage of tending to equalize the experimental conditions; it may also bring to light latent deficiencies. The phenolsulphonephthalein test fails to do this. Representing, as it does, the excretion of a minute amount of a foreign substance, no strain is imposed by this test on the capacity of the kidneys. Its main value lies in indicating the presence and perhaps the degree of pronounced renal disease. Doubtless some other test of a type like the experimental one just reviewed, which will place a strain on the kidney tissue in excreting an unusual amount of some normally present catabolite, such as urea, will better serve for the diagnosis of a latent defect. A further search in this direction may therefore seem worth while.

THE SARGOL VERDICT—AN INSPIRATION

The Sargol verdict, briefly referred to under New York news last week, is one of the most encouraging incidents in the movement toward truth in advertising. Sargol was a nostrum of the get-fat-quick variety; as an alleged "flesh builder" it was advertised extensively and intensively by its exploiters. Two facts it had in its favor: it was not advertised, directly at least, for the cure of disease and it contained no dangerous or habit-forming drugs. The chief, if not the only, objection to the nostrum was the simple fact — now a matter of court record — that its sale was an outrageous and impudent fraud. To one not familiar with the curious mental slant of certain advertising managers this last objection might seem all-sufficient to bar advertisements of Sargol from all decent newspapers and magazines. Not so! The attitude of some newspaper publishers on the subject of "patent medicine" advertising is this:

"Does the preparation contain any habit-forming or dangerous drugs?"

"No!"

"Then take the advertisement."

Other publishers add another question:

"Is the product recommended for serious diseases?"

"No!"

"Then the copy is acceptable."

The fact that a nostrum is sold under claims that are obviously or demonstrably false is brushed aside with the sophistry that claims made for "patent medicines" are "matters of opinion!" That Sargol passed muster on the two questions just propounded doubtless explains why many newspapers and magazines sold their space to the exploitation of this medical fake. From a legal point of view the Sargol case was remarkable in that the essential question involved was fraud — not danger to the public health, not a violation of some drug law — just simple, elemental fraud! The case, which was a criminal one, lasted thirteen weeks; the defendants, who were shown to have made over half a million a year, had the wealth and the influence of the nostrum fraternity behind them. Yet the Government won! Attorney F. J. Cregg and his associates, on whom fell the burden of protecting the public, can justly feel proud of having performed a notable public service. Especially will the ever-growing army of men who believe in honest advertising rejoice in the outcome of this case. For it means that we are brought materially nearer the time when the man with a worthwhile product and a desire to sell it honestly will not be handicapped by having his goods placed in juxtaposition with confidence-destroying humbugs, medical or otherwise.

PIDAN—AN ORIENTAL FOOD

Food conservation is not a novelty which has come into vogue with the introduction of cold storage plants or chemical preservatives. All sorts of procedures for desiccating, smoking, pickling and otherwise handling perishable foods have been known almost from time immemorial. Edible products are often saved from spoiling by being converted into new forms of food materials, as cheese is prepared from milk, or catsup from tomatoes. The Chinese and other Oriental peoples preserve eggs in an analogous manner by making an altered product out of them. This food material, known as pidan, has recently received an extensive examination in the laboratory of food chemistry of the Department of Home Economics at the University of Chicago.[1] Pidan is made on a factory scale from ducks' eggs. The latter are kept in an infusion of black tea, lime, salt and wood ashes — obviously an alkaline solution — for nearly half a year, much as eggs are preserved in solutions of sodium silicate in this country. They are then drained and coated with rice hulls, whereupon they are ready for the market. The taste of the pidan is characteristic and the odor markedly ammoniacal. There is a tendency for uninformed persons to class such products unreservedly with what are commonly termed rotten eggs. This may not be justifiable. Pidan has no odor of hydrogen sulphid and, we are assured, does not closely resemble so-called decomposed eggs. Noteworthy chemical changes do, however, attend the long storage process in the formation of pidan. The Chicago investigators state that water in large quantities has been transferred from the white to the yolk, and water has been lost from the white to the outside. The ash and the alkalinity of ash have increased in a way similar to that of other eggs preserved in alkali. The ether extract has decreased and its acidity is high. Both total

1. Blunt, Katharine, and Wang, C. C.: Chinese Preserved Eggs—Pidan, Jour. Biol. Chem., 1916, **28**, 125; abstr., THE JOURNAL A. M. A., Jan. 6, 1917, p. 66.

and lecithin phosphorus have decreased. The noncoagulable nitrogen has increased and also the ammoniacal nitrogen, the latter to an extraordinary degree, and the amino nitrogen is high. From these changes the conclusion is drawn that decomposition of the egg protein and the phospholipoids has taken place. The production of pidan from the fresh eggs is probably brought about through the agency of the alkali, bacteria and enzymes. Like cheese, the product is eaten without being cooked.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CALIFORNIA

Personal.—Dr. Edwin J. Boyes, Oakland, was seriously injured in a collision between a Southern Pacific electric train and his automobile in Oakland.

Book Night.—The San Diego Medical Library held its annual "Book Night," January 30. Each member was asked to contribute at least one textbook on medicine.

Proposed Consolidation of State Boards.—A bill introduced in the senate proposes to abolish the state boards of dental examination, medical examination, optometrists and embalmers, and to consolidate them with the state board of health. This would mean the saving of about $35,000 a year to the state. The act also provides for three lay members on the state board of health, who shall receive a salary of $2,400 a year.

Psychopathic Hospital Urged.—A bill prepared by the state board of health carrying with it an appropriation of $500,000 provides for the establishment of a state psychopathic hospital to be located near the University of California Medical School in San Francisco, to be governed by the university regents with the professor of psychiatry as ex officio director. The hospital is to provide not only a research laboratory but treatment for all patients requiring special or intensive study for a short period.

ILLINOIS

Personal.—Dr. William L. Hanson, Belleville, has left for England, where he has received an appointment in the British Hospital Medical Service.

Tuberculosis Survey.—The Illinois Tuberculosis Association is arranging for a tuberculosis survey of LaSalle, Adams, Morgan, McLane, Champaign, Livingston, Ogle and King counties.

Proposed Consolidation of Boards.—Bills reorganizing the state executive department in accordance with the plans of Governor Lowden have been introduced in the house and senate. Under the proposed plan the department of registration and education is to include the bureau of registration, which will have charge of the licensing of physicians, dentists, pharmacists, optometrists, barbers, nurses and all other members of professions and trades for whom state certificates are necessary. The bill also transfers the state food commission from the department of health to the department of agriculture.

Chicago

Personal.—Dr. Lowell F. Ingersoll was run over by a street car, January 22, and sustained severe injuries of the foot.

Heat Stroke Research.—The directors of the Fenger Memorial Association have made a grant of $400 for research on heat stroke.

Dr. Billings Ill.—Dr. Frank Billings was taken ill with pneumonia on Saturday, February 3. The latest reports are that he is progressing favorably.

Internship Examinations.—Examinations for internship in Cook County Hospital will be held March 13 to 15. Graduates of medical schools in Cook County are eligible.

Free Water for Hospitals.—An ordinance fixing the license fee for hospitals at $50 and granting free water to institutions was recommended by the committee on health of the city council, February 1.

Municipal Tuberculosis Sanatorium.—Dr. Charles P. Caldwell, president of the board of directors of the Chicago Municipal Tuberculosis Sanatorium, proposes the establishment of a tuberculosis diagnosis station for each side of the city, and states that two of these stations can be completed by October if the project is approved.

Clinic Week for Women Physicians.—The medical women of Chicago announce a clinic week to be held in Chicago, February 12 to 16. Clinics will be held at many of the leading hospitals and special lectures will be given on eugenics and social hygiene. A schedule of the clinics may be obtained from Dr. Rachel Watkins, secretary of the Medical Women's Club, 25 East Washington Street.

INDIANA

Vaccination Ordered.—The city board of health of Terre Haute has issued an order that all of the 11,000 pupils of the public schools must be newly vaccinated for smallpox unless they can show certificates of vaccination within seven years. About thirty cases have been reported so far in Terre Haute.

Personal.—Dr. Henry O. Bruggemann, Fort Wayne, president of the local health board, sailed from New York for Vienna for Red Cross work, February 3.——Dr. Arett C. Arnett, Lafayette, commander of Ambulance Company No. 2, Ind. N. G., gave a talk before the Tippecanoe County Medical Society, January 23, on "Conditions on the Mexican Border."——Dr. Brown S. McClintic, Peru, after three years' service with the Russian army, is on his way home by way of China.——Dr. Paul F. Martin, Indianapolis, who went abroad last May under the auspices of the American Relief Expeditionary Association, is now in charge of 2,000 beds in the military hospital at Pardubitz, Austria.——Dr. Donald C. McClelland, Lafayette, M. C., Ind. N. G., has returned from service on the southern border.

IOWA

Summer School for Physicians.—The University of Iowa announces that it will give a summer course in medicine during June and July next. The course will cover four weeks, beginning June 18.

Hospital Property Purchased.—The Buchanan County Hospital Committee has purchased a site for $7,000. More than $60,000 of the $75,000 required for the establishment and equipment of this hospital has already been subscribed.

Personal.—Dr. Will D. Runyon, at present superintendent of the Union Printers' Home at Colorado Springs, and formerly assistant superintendent of the State Sanatorium, Oakdale, has been appointed medical director of the Woodbury County Tuberculosis Hospital.——Dr. Lena A. Beach, Carroll, has been appointed head of the Women's Reformatory, Rockwell City.——Dr. Eugene O. Koeneman, Eldora, has been appointed physician to the State Industrial School for Boys.

KENTUCKY

Hospital Head Retires.—Sister Euphrasia, for more than forty years superintendent of St. Joseph's Hospital, Lexington, retired, January 28, and will spend the balance of her life at Nazareth.

Personal.—Dr. John G. South, Frankfort, was elected president of the Kentucky State Board of Health, January 9, for the fourth consecutive term.——Dr. H. H. Carter, Shelbyville, has been appointed a member of the state board of health, succeeding Dr. O. C. Robertson, Middlesboro.

MARYLAND

Personal.—Word has reached Baltimore of the illness of Dr. Howard A. Kelly, who is now at Kissimee, Fla. His condition is said not to be alarming.——Dr. George H. Hocking, Govans, who was shot several times by a demented patient, is recovering and will leave shortly for New York to recuperate.——Dr. Irvin M. Wertz, Hagerstown, was severely injured recently when a taxicab in which he was riding collided with a delivery truck.

More Room for Insane Needed.—As a result of the failure of the last legislature to provide funds for the erection of buildings at the state hospitals for the care of the insane, the City Detention Hospital for the Insane at Bay View will be

overfilled by the end of 1917. There are now 268 insane patients at the institution, as compared with 139 a year ago. The legislature voted in favor of state care of all indigent insane in Maryland, but the last legislature failed to provide for new buildings.

MASSACHUSETTS

Physical Training in Public Schools.—A committee of leading educators has been formed to secure adoption of a bill, drafted by Dr. Dudley A. Sargent, Harvard, providing for physical training without military features in the public schools.

MONTANA

Personal.—Dr. James H. Drake, Mondak, has been appointed county physician of Bighorn County, and Dr. Wilson A. Russell, Hardin, county health officer.

Physicians and Surgeons Building Incorporated.—Articles of incorporation of the Physicians and Surgeons Building Commission, Butte, have been filed. The company has a capital stock of $100,000.

Society Condemns Contract and Fraternal Practice.—The Missoula County Medical Society has gone on record as condemning fraternal or large contract practice, by its endorsement of a report of the committee appointed on that subject, of which Dr. George M. Jennings, Missoula, was chairman.

NEBRASKA

Personal.—Dr. J. S. Anderson, Seward, has been reappointed state veterinarian, and Dr. W. T. Pritchard, North Platte, has been appointed deputy state veterinarian.——Dr. James D. Case, Dorchester, has been reappointed state health inspector of the state board of health, and Dr. William F. Wild, Lincoln, state bacteriologist.——Dr. Frank S. Owen has been elected president, and Dr. Ernest T. Manning vice president of the Omaha University Club.——Dr. William L. Ross, Omaha, was painfully injured by the overturning of his automobile, January 10.

NEW MEXICO

Resigns Commission.—Dr. Henry A. Ingalls, Roswell, has resigned his commission in the Medical Corps of the National Guard, and has resumed practice at Roswell.

Visiting Nurse for Schoolchildren.—As a result of the cooperation between the medical and dental professions, and the school authorities of Albuquerque, a school and visiting nurse has been employed to secure a better standard of health among schoolchildren.

NEW YORK

Birth Control Legislation.—A bill designed to legalize the dissemination of knowledge regarding the prevention of conception was introduced into the legislature, January 24, by one of the socialist members of that body.

New Long Island Hospital.—The Mercy Hospital, a small institution conduced by the French Nursing Sisters at Hempstead, L. I., is to enlarge its activities. A 97-acre site has been purchased and plans are completed for the erection of a group of hospital buildings to cost $100,000, one of which will be a convalescent home costing $30,000.

State Death Rate.—The state health department reports that for 1916 the death rate for the state was 14.6 per thousand population. With the exception of 1915, when the rate was 14.5, this is the lowest annual death rate recorded in the state. The infant mortality rate has been cut from 110 per hundred thousand population in 1906 to 51.2 in 1916. Measles alone of the infectious diseases has shown a slightly higher rate of mortality than in preceding years. The mortality rate of typhoid fever fell to 5.8 per hundred thousand as compared with 15 in 1910, and 26.7 in 1900.

Personal.—Dr. John H. Pryor has been elected president of the Buffalo Association for the Relief and Control of Tuberculosis.——Dr. Edgar R. McGuire, Buffalo, has been elected to the chair of surgery in the Medical Department of the University of Buffalo, to fill the vacancy caused by the death of Dr. Roswell Park.——Dr. Samuel M. Strong has been elected chief of the surgical staff of the Flushing Hospital, to succeed Dr. C. B. Story.——Dr. Anthony F. DeGrafenried, Bayside, has been elected secretary of the surgical staff of the hospital, succeeding Dr. George J. J. Lawrence, who is with the troops on the Southern border.

Chamber of Commerce Opposes Compulsory Health Insurance.—The New York State Chamber of Commerce has put itself on record as opposed to the Mills bill for compulsory health insurance which was introduced into the senate, January 15. The committee held that the expenses of sickness, allowance for medical attendance, etc., should be borne by the employer and employee, in equitable proportions and the state should pay only the expense of supervision. The chamber, however, favored the creation of a commission by the legislature which should ascertain whether employees are receiving a living wage and investigate the conditions under which they live.

New York City

Polk Portrait Presented to Academy.—At a stated meeting of the Academy of Medicine, February 1, Dr. Walter B. James announced that the portrait of Dr. William M. Polk had been presented to the academy, and that this completed the full line of portraits of presidents of the academy. Dr. George D. Stewart made the address of acceptance on behalf of the academy. The portrait is the work of Miss Belle Isaacs.

Wellington Law in Effect.—The Wellington law which went into effect, February 1, provides that children must remain in school until they are 15 years of age, or if they wish to go to work before reaching that age, that they must be graduates of elementary schools. Under this law the state industrial commission supervises the issuing of permits to children by health officers. The 50,000 children to whom permits to work have been issued during the past year are not affected by this law. It affects only the children who will seek permits from now on.

Personal.—Dr. Douglas Symmers has been appointed assistant director of the pathologic laboratories of Bellevue and Allied hospitals.——Dr. Sigismund S. Goldwater has been appointed, by the board of estimates, consultant on health and hospitals.——Dr. Arthur Freeborn Chase has been elected a member of the board of trustees of Bryn Mawr College.——It is announced that on May 1, Dr. John S. Billings, deputy commissioner of health, will retire after more than twenty years of service. Dr. Billings expects to continue his work in preventive medicine as health officer for the stock exchange and public library.

Death Rate Still High.—The hospitals of this city are overcrowded and this condition is reflected by the mortality statistics. For the week ending January 27 there were almost 100 more deaths than during the corresponding week of last year, the rate being 17.34 as against 16.46 for the corresponding week of 1916. As during the preceding weeks, respiratory diseases were largely responsible for the increased morbidity and mortality. The contagious diseases, scarlet fever, measles and diphtheria are not as prevalent as during previous years. The city hospitals for contagious diseases are filled to only 25 per cent. of their capacity.

Public Health Education in the Movies.—The state health department's bureau of education find that free shows do not attract any considerable number of spectators, or arouse as much interest as shows for which admission is charged. For these reasons the bureau of public health education has arranged to loan health reels free to moving picture theaters which will show them as a part of their regular program. The pictures shown have an introductory legend and a "trailer" indicating that they are shown by the department of health. The department requests any one interested in this form of public health education to arrange with their neighborhood moving picture theater for the display of health films.

Eating Places Must Have Permits.—Because of certain legal difficulties encountered by the department of health in dealing with insanitary and dirty restaurants and hotels, the board of health has enacted an ordinance prohibiting the operation of any restaurant in New York City except under a permit from the board of health. The term restaurant in this ordinance includes every buffet, lunch room, grill room, lunch counter and every other place where food is prepared, cooked, served, sold and consumed on the premises and every counter in a saloon where food is given away. The permit system will go into effect immediately and will be similar to that used so successfully by the department in the control of the milk supply.

Council of State Medical Society Reproved.—At the last meeting of the New York County Medical Society a resolution was passed disapproving of the action of the council of the state medical society in endorsing the tentative draft of the compulsory health insurance bill. While it was acknowledged that the council of the state society had not transcended its powers in taking this action, it was the prevailing opinion that such action should not have been taken until the county

societies had had time to discuss the proposed bill and had expressed an opinion on it. At this meeting the proposed medical practice act, which would require annual registration, carrying with it a fee of $2, was also discussed and disapproved. It was the consensus of opinion that any help that it might lend in the prosecution of illegal practitioners was more than counterbalanced by the inconvenience it would impose on the members of the profession.

PENNSYLVANIA

Academy Purchases Building.—The Pittsburgh Academy of Medicine has purchased the property of the Bellefield Club, a lot 50 by 140 feet, with a two-story brick building, for the sum of $2,500.

Typhoid in Centre County.—Up to February 1, there were reported ninety cases of typhoid fever in the south precinct of Rush Township, Centre County, with one death. The hospital and private sanatorium of Philipsburg are taking care of as many patients as they can accommodate. The fever in nearly every case has been found in the homes supplied with water from one source. A warning has been given to boil all water and the reservoir and pipe line are to be given a careful investigation.

Personal.—Dr. John B. McAlister, Harrisburg, has been elected a trustee of Gettysburg College.——Dr. George B. Kalb, Erie, who has retired from practice and removed to California, was recently presented a silver loving cup by the Erie Antituberculosis Society.——H. Lyndley Hosford, who had been secretary to Commissioner of Health Samuel G. Dixon for five years, has resigned to resume charge of the campaign of a committee of citizens of New York, proposing the enactment of health laws similar to those of Pennsylvania.

Philadelphia

Medical Institutions.—An elaborate statement was issued, January 27, by the pneumonia commission of the Department of Health and Charities which is actively continuing its study of the causes and conditions responsible for grip and pneumonia. This commission is headed by Dr. David Riesman.

College Endowment.—A reunion supper of more than 100 workers for the endowment fund for the Women's Medical College of Pennsylvania was given, February 2, in the college building. The purpose of the meeting was to elect new officers, to obtain a charter, and to get on a permanent working basis so that the fund of $70,000 now on hand can be raised to $1,000,000.

License Test Case.—John A. Seibert, a neuropath, was convicted, January 30, before Judge Martin in Quarter Sessions Court for practicing medicine without a license. The prosecution was brought by the State Bureau of Medical Education and Licensure, and was a test case to determine whether neuropaths are compelled to be licensed. Sentence was deferred until the disposition of a motion for a new trial should be announced.

New Officers.—Society of Normal and Pathological Physiology: president, Dr. Paul A. Lewis; vice president, Dr. Oliver H. P. Pepper; secretary, Dr. A. N. Richards, and treasurer, Dr. Edward B. Krumbhaar.——Philadelphia Neurological Society, January 26: president, Dr. Williams B. Cadwalader; vice presidents, Drs. Max H. Bochroch and Samuel D. Ingham; secretary, Dr. Samuel Leopold, and treasurer, Dr. Nathaniel S. Yawger.——Philadelphia Genito-Urinary Society: president, Dr. Hiram R. Loux; vice president, Thomas R. Neilson, and secretary-treasurer, Benjamin A. Thomas.——Physicians Motor Club: president, Dr. S. Leon Gans; vice presidents, Drs. John J. Robrecht, Charles A. E. Codman and Charles R. Haig, Jr.; secretary, Dr. Howard A. Sutton, and treasurer, Dr. Lewis H. Adler.

Legislation for Clean Streets.—Legislation giving state officials power to compel Philadelphia street cleaning contractors to clean up the streets and to comply with state regulations is being considered by the legislative committee of the Walnut Street Association. The 1917 specifications for street cleaning have not been lived up to by the contractors. They are not using water or flushing streets, and the block men are not obeying the rules, which specify the carrying of sprinkling pots in front of every dust carrier. The widespread epidemic of pneumonia, grip and other disorders is probably caused in some degree by the condition of the streets, and unless they are cleaned up it is feared the toll may be heavy in infantile paralysis victims during the coming summer. Since January 1 there have been 752 deaths from pneumonia in Philadelphia, as compared with 675 during the same period in 1916.

VERMONT

New Members.—The governor has made the following appointments on the State Board of Medical Registration: Dr. W. Scott Nay, Underhill, reappointed for six years; Dr. Amos Eugene Parlin, Island Pond, a former member of the board, eclectic member, for six years, and Dr. Edward Kirkland, Bellows Falls, as homeopathic member, to fill out four years of the unexpired term of Dr. E. B. Whittaker.

Personal.—Dr. William R. Rowland, East Corinth, is said to have retired from practice and has entered the universalist ministry. He will be in charge of parishes at New Madison, Greenville and Palestine, Ohio.——Dr. Don D. Grout, superintendent of the State Hospital, Waterbury, for twelve years, has resigned, and has been succeeded by Dr. Watson L. Wasson, assistant superintendent.

CANADA

The Ontario Medical Commission.—Mr. Justice Hodgins resumed the sittings of this commission the past week. Lieut.-Col. Irving H. Cameron of the University of Toronto urged that a proper diagnosis could only be made except through a complete knowledge and understanding of the human body, and that massage treatment, such as osteopaths and chiropractors used, was not neglected in the medical courses of the universities.

Feebleminded Require Institutions.—The annual meeting of the Ontario Society for the Care of the Feebleminded was held in Toronto, February 2. Dr. Joseph D. Page, superintendent of the Immigration Hospital, Quebec City, spoke on feeblemindedness in relation to immigration, stating that, owing to hasty examinations and lack of specially trained examiners, many mentally defective persons were admitted. He advocated the inspection of immigrants before their tickets were bought, and also that Canadians should be employed as ship surgeons. Dr. Gordon Bates, Toronto, outlined the work of the Toronto branch of the society. The city council favored using the Industrial Farm, and would ask the legislature for permission to raise the money for the erection of suitable buildings.

University Men Overseas.—Brown, Toronto, 1908, is recovering from enteric fever in St. George's Hospital, Bombay, India; Little, Toronto, 1914, is on sick leave in India following paratyphoid fever; Maclachlan, Queen's, is in Colaba Hospital, Bombay, recovering from fever; Moon, Toronto, 1914, and Ball, Toronto, 1914, are at the front in Mesopotamia; Roy Philips, Toronto, 1914, is with No. 23 Indian General Hospital at Basra, Mesopotamia; Dr. Ramsay, McGill University, is at the front in Mesopotamia; Lyons, Dalhousie University (Halifax, N. S.), is also in Mesopotamia; Lieut. Edward Fidlar, R. A. M. C., is in Bombay.——Lieut.-Col. Ethelbert B. Hardy, D. S. O., Toronto, has been appointed commanding officer of the Toronto Base Military Hospital, succeeding Major Camown A. A. Warren, who returns to the headquarters staff, Military District No. 2, Toronto.——Capt. W. L. C. McBeth, Toronto, is to command the Military Hospital at Hamilton, Ont.——Capt. J. S. McCallum, winner of the Military Cross, is to be assistant to Captain McBeth.

Personal.—The Victoria Cross has been awarded to Major Roscoe D. Arnott, Stratford, Ont., for conspicuous bravery on the field of action.——Lieut.-Cols. Robert Rennie, Toronto, and Edward C. Hart, Victoria, B. C., C. A. M. C., have been made Companions of the Order of St. Michael and St. George.——Capt. John Arthur Cullum, Regina, Sask., C. A. M. C., has been awarded the Bar to the Military Cross for evacuation of the wounded under heavy fire.——Major Charles Carter, Hamilton, Ont., C. A. M. C., has been appointed deputy assistant director of medical services in charge of the troops at Hamilton, Brantford, St. Catherines and Niagara Falls, Ont.——Capt. Malcolm A. Carmichael, Strassburg Station, Sask., C. A. M. C., medical officer of the Ninety-Sixth Winnipeg Reserves, has been transferred to the medical training school at Shorncliffe, England.——Lieut.-Col. George Clingan, C. A. M. C., Brandon, Man., has been given command of the Canadian Convalescent Hospital at Monks Horton, England. Capt. John M. Eaton, Winnipeg, Man., has been appointed second in command.——Dr. Charles C. Tatham, formerly of Cargill, Ont., has been appointed medical superintendent of the Strathcona Hospital, Edmonton, Alta., which was taken over by the Military Hospitals Commission early in December. Dr. Hobert L. Collins has been appointed to the staff of that hospital.——Major W. W. Judd and Capt. C. H. Hudson have resigned their commissions in the Canadian Army Medical Corps.

GENERAL

Missouri Valley Physicians to Meet.—The annual meeting of the Medical Society of the Missouri Valley will be held in Keokuk, Iowa, March 22 and 23, under the presidency of Dr. Charles R. Woodson, St. Joseph, Mo. The society will be the guests of the Physicians Club of Keokuk.

Bequests and Donations.—The following bequests and donations have recently been announced:

Methodist Hospital, Philadelphia, $5,000, by the will of A. A. Stephens, Tyron, Pa.

The Appui aux Artistes, Blind French Soldiers' Hospital, at Parma, Italy, and the Italian Red Cross, equal parts of $13,500, the net proceeds of an operatic entertainment, given in Chicago, January 21.

Fish Hatchery Discontinued.—On the recommendation of the commissioner of fisheries, the secretary of commerce has discontinued the fish hatchery located at Havre de Grace, Md., at the mouth of the Susquehanna River, for the propagation of shad (*Commerce Reports*, Jan. 31, 1917). The legislature of Maryland has neglected to provide legislation protecting this fish, so that the take of shad roe has fallen in twenty years from about 210,000,000 maximum to a little over 2,000,000 minimum, increasing the cost of propagating the fish at this station to more than twelve times what it formerly was.

FOREIGN

French Physicians Raise Their Fees.—The syndicate of physicians of the Seine district have agreed to charge 25 per cent. more for their services hereafter for clients who have not had to suffer directly from the fact of the war.

New Hospital for Women at Munich.—The new Universitäts-Frauenklinik was recently dedicated at Munich. It is said to be the largest of the kind in Germany. The building alone cost 3,000,000 marks, about $750,000, and the equipment nearly a third as much. Döderlein is the chief of the clinic.

Embargo on Medicinal Herbs.—The French government by decree of Jan. 25, 1917, from and after January 27 prohibits the export, etc., of fruits for distilling, and roots, herbs, flowers, leaves, barks, lichens, fruits and seeds of medicinal character, subject to the usual exceptions (*Commerce Reports*, Jan. 31, 1917).

Coffee Grounds as Feed for Cattle.—A company in Berlin is collecting coffee grounds, and especially the grounds from the various cereal substitutes for coffee, and is drying them to use as feed for cattle. An official appeal is made to restaurant keepers and others to save and collect the grounds for this purpose.

Chair for Welfare Work Founded at the Collège de France, Paris.—The city and county authorities of Paris have founded and appropriated funds for a chair of *prévoyance et assistance sociales* at the Collège de France of the University of Paris. The incumbent of the chair has not been selected as yet. The salary is to be 12,000 francs, about $2,400.

Homage to Gersuny.—On the occasion of the fiftieth anniversary of R. Gersuny's entering on the practice of his profession, an endowment fund was presented in his name to the training school for nurses connected with the Rudolfinerhaus at Vienna which he was mainly instrumental in founding. The fund is for welfare work among the nurses.

Institute for Research on Psychiatry.—A number of members of the Kaiser Wilhelm Association have planned a German institute for research on psychiatry. The funds subscribed as yet do not permit an independent establishment, but it is proposed to organize an institute of the kind as a branch of the Munich psychiatric clinic, after the close of the war.

"Treatment of Hernia Without an Operation."—The military authorities in the Berlin district have closed the Colemann establishments at Berlin. Colemann is said to be of English birth and advertised to cure hernia without operative measures, working under his own name and as the Dr. Colemann's Bandagengesellschaft m. b. H. He had been several times reprimanded by the Berlin Tribunal of Honor, but now the military authorities have put him out of business.

The Kraussianum at Munich.—Nearly $400,000 was bequeathed in 1910 to the city of Munich by Dr. G. Krauss to found, as a memorial to his father, an institution for mechanical and other forms of orthopedics, especially those practiced by the elder Krauss. The stately building housing it is now completed. It stands on the grounds of the University orthopedic clinic with which it is closely affiliated, Prof. F. Lange being in charge.

Deaths in the Profession Abroad.—**A. Chauveau,** the biologist and physiologist, at Paris, aged 89.——**Huguet Pike,** an American doctor at Paris, admitted to practice in France in 1869, chevalier of the Légion d'honneur.——The former professor of ophthalmology at the Universities of Bern and Rostock, **von Zehender,** aged 91.——**C. Posselt,** professor of diseases of the skin and syphilis, at the University of Munich, aged 79.——**E. Leser,** professor of surgery at the University of Halle until 1894, since then he has been living at Frankfurt a. M.——**H. Schule,** director of the insane asylum at Illenau and coeditor of the *Allgemeine Zeitschrift für Psychiatrie*, aged 76.——**W. Lublinski,** author of numerous works on his specialty, laryngology, aged 64.

Centennial of Father of Atomic Notation, Isolator of Several Familiar Drugs.—The Chemical Society of France held a memorial meeting, December 9, on the hundredth anniversary of the birth of the French chemist, C. F. Gerhardt, 1816-1856. His fame rests mainly on his conception of the molecule as a unitary structure, built of atoms, as the basis of all substances. Among the chemicals he isolated are said to be acetanilid, acetylsalicylic acid and cinnamic acid. With Laurent he founded a school of practical chemistry at Paris the aim of which was to "teach the art of the laboratory to students entering a scientific, medical or pharmaceutic career or industrial chemistry." The school was not commercially a success, and Gerhardt's life was a struggle, sacrificing his position, his fortune and even his life, to the search for truth, dying at 40. He was professor at the University of Strasburg the last year or two of his life.

WAR NOTES

Losses in the Profession in Germany.—The *Deutsche medizinische Wochenschrift* of Dec. 14, 1916, gives the number of physicians who have fallen at the front as 395; 214 have died from sickness contracted in the course of their service with the troops; 221 have been severely wounded, and 677 wounded but not severely, while 200 have been taken prisoners and 110 are missing. These figures are from the German casualty lists 1 to 700.

Virchow's Medals Donated to the Common Cause.—Rudolf Virchow's family have donated to the Berlin Goldsammelstelle seven gold medals that had been conferred on the scientist by foreign scientific organizations. The medals have a total weight of 1,200 gm. and are valued at 2,800 marks in gold, about $650. The heirs of Mommsen have taken a similar step, turning in to the gold reserve the medals that had been awarded to Mommsen in his day.

The Interned Sick and Wounded in Switzerland.—The *Münchener medizinische Wochenschrift* states that fully 30,000 sick and wounded are now interned in Switzerland and being cared for there. This, it adds, is a most comprehensive practical philanthropy which insures the permanent gratitude of all the countries involved. There have been 128 cases of insubordination compelling disciplinary measures, and twelve of the interned had to be returned to the prison camps whence they came.

Effect of War Diet on the Sick.—The local sickness insurance societies of Berlin have recently sent out question blanks to the physicians connected with the work to inquire as to the effect of the war diet on different categories of the sick, whether it has a depressing influence on the resisting powers or not. Separate reports are asked for those under and over 18, and for men and boys and women and girls. Special data are also sought as to the influence of the war diet on the anemic, the nervous, the tuberculous, those with stomach trouble, with acute diseases, and the pregnant.

Vacation in Norway for Nurses with the Belligerent Forces.—Our German exchanges mention that at the recent annual gathering of the hotel proprietors of Norway, a suggestion was made by the chief of the medical department of the Norwegian army to the effect that the hotel proprietors offer the nurses at the hospitals of the belligerent forces free accommodations to enable them to get a brief rest and respite. The plan was cordially taken up and backed by private individuals, and invitations for the purpose have been sent to the headquarters of the forces of each of the belligerent nations. An equal number of nurses from each of the forces is planned.

Conference to Study Welfare Work for War Cripples.—A conference for the study of professional retraining and of other questions affecting the wounded in war is to be held by representatives of the Allies at Paris, March 6, under the initiative of the Belgian government. The organizers of the

conference are appealing to all experts in any of the questions relating to this subject to report to the secretary, rue du Bocage de Bléville, Havre, or the Office National des Mutilés et Réformés de la Guerre, 97 quai d'Orsay, Paris. The five sections are devoted to the physical and the professional training, the placing of the men, and their economic and social interests.

Typhus and Smallpox in Poland.—The *Berliner klinische Wochenschrift* gives the figures for the incidence of these diseases in the newly acquired portion of Poland, now called the Generalgouvernement Warschau since the occupation by the Germans. By three-month periods there have been 704; 5,256; 6,294, and 2,309 cases of typhus, with, respectively, 32; 428; 510, and 140 deaths. The corresponding figures for smallpox are 955; 1,029; 918, and 195, with 157; 144; 130, and 23 deaths. The figures show that the health authorities are getting the diseases under control, and that smallpox will soon be practically stamped out, while typhus is also declining. There have been no cases of cholera in the district for more than a year.

The New Law for Patriotic Service in Prussia.—Conferences are being held by the university authorities, medical societies and groups of all kinds of organizations to discuss ways and means for carrying into effect the provisions of the law for auxiliary patriotic service, *vaterländische Hilfsdienst*. The law went into effect, Dec. 5, 1916, and mobilizes the entire population between the ages of 16 and 60, not directly engaged in the war. The government authorities and the representatives of the organized physicians have been in prolonged and confidential conference over the working of the law as it affects medical men and medical students. The outcome has not been made public as yet.

BERLIN LETTER

(Received Jan. 26, 1917)

BERLIN, Dec. 4, 1916.

Personal

Nov. 12, 1916, Professor Bruns, the neurologist, died in Hanover at the age of 58. He had been one of the pupils of Professor Hitzig of Halle. His best known published work is the section on tumors of the nervous system in Nothnagel's "Special Pathology and Therapy." His contribution to the subject of hysteria in children is also well known. His last work of any great size was the "Handbook on Diseases of the Nervous System of Children," in which he was a collaborator of Ziehen and Cramer. He also made many individual contributions to the diseases of the spinal cord, tumors of the brain and their treatment, the neuritides of diabetes mellitus, etc.

Prof. E. Gaupp, ordinarius in anatomy in Breslau, died suddenly, Nov. 24, 1916. He had succeeded Professor Hasse in this position at the beginning of the present semester.

Health of the German Army

A recently published report of a member of the medical division of the army details the morbidity of the troops from the beginning of the war to February, 1916. The figures are made on the basis of a thousand. The average monthly morbidity from August, 1914, to January, 1915, was 129.3; from February to July, 1915, it was 114.2; from August, 1915, to January, 1916, it was 105. The morbidity rate has not increased since then. Particularly noteworthy is the absence of any epidemics. The results of the surgical treatment given in the various hospitals were exceptionally good. The results are given in percentages, as follows: 86.6 per cent. recoveries in the field military hospital, and 90.1 per cent. in the home hospitals; only 1.5 per cent. of the wounded and sick died. These percentages could have been obtained only by having efficient medical care and a well trained corps of nurses. At about the middle of 1916, 18,000 physicians were in the field, and 6,000 were attached to the military service at home. Four thousand served as volunteer nurses. The medical service was aided by 92,000 members of the sanitary division and army nurses, 23,000 male and female nurses in the military districts, and 72,000 in the home hospitals. Nervous diseases occurred less frequently in the troops in active service at the front than among those not so engaged. Diseases due to exposure occurred much less frequently than one would suppose. The supply of drugs is more than sufficient. It is ample to permit of furnishing drugs to the armies of all the central powers. The recently adopted steel helmet has proved to be of great value. Without any forehead protection it wards off shrapnel bullets, pieces of shell and other larger explosives, and with the forehead protection it even wards off rifle shots.

NEUROSIS AND NATIONALITY

In a recent number of the *Wiener klinische Wochenschrift*, Dr. Schneider discussed the predisposition of various nationalities to diseases of the nervous system, basing his remarks on observations made on Austro-Hungarian soldiers. He found that the Magyars, the Roumanians and the Czechs were particularly predisposed to severe nervous disturbances as the result of their war experience. The Poles and German-Austrians occupy the middle ground, whereas the Jew shows a strong predisposition to these diseases. From the literature the impression is gained that nationality and race play a considerable rôle in the etiology of functional nervous disturbances, especially of the hysterical type. While Schneider's observations confirm these impressions, the result was not quite what the literature would lead one to expect. The Poles, for instance, show a predisposition to severe nervous disturbances of all kinds. However, the percentage of persons so affected corresponds with the average of all nations (about 12 per cent.). All the remaining Slavs, excepting the Czechs, show a much lower percentage. A proper conception of the percentages given by Schneider can be gained by considering only those nationalities which were represented by more than 100 patients. These were the German-Austrians, the Czechs and the Magyars. The Poles were represented by eighty-one cases, too few to permit of drawing definite conclusions. All disturbances of the nervous system occurring among the first three nationalities mentioned above were as follows: Among 377 Germans there were thirty-three cases (9 per cent.); among 194 Czechs there were thirty cases (15 per cent.), and among 199 Magyars there were thirteen cases (6.5 per cent.). There were seven cases of ambulatory war neuroses, all occurring among the Czechs who, on the whole, seem to be particularly predisposed to traumatic hysteria. About 40 per cent. of the Jews had nervous disturbances, mostly mild in type, with complete recovery and rarely exhibiting hysterical symptoms. Of the Roumanians, 21 per cent. were affected, and of the Germans only 13 per cent.; of the Ruthenians and southern Slavs, 11 per cent. A strong predisposition to the apathetic depressive nervous diseases was noted among the Roumanian soldiers, such cases occurring even when the troops were on the march.

Campaign Against Venereal Diseases

The Prussian medical commission has formulated the following rules of governing the campaign against venereal diseases: 1. General rules for combating venereal diseases: (*a*) improving the economic status of the population so as to make early marriage possible, and to guard the female population against delinquency; improving housing conditions and instituting official supervision of homes; (*b*) instituting instruction on sexual life and especially on the dangers of extramarital sexual relationship and of sexual diseases; (*c*) improving the physical and moral status of youth by means of gymnastics, play and sport; (*d*) instituting a campaign against the misuse of alcohol; (*e*) improving the diagnosis and treatment and preventing the spread of venereal diseases; (*f*) improving the means and methods for treating venereal diseases, erecting dispensaries in which such diseases can be treated, with the assurance of absolute secrecy as to the identity of the individual and treating all severe cases in an institution; (*g*) proper instruction by the physician as to the dangers of venereal diseases, their method of spread and especially the precautions which must be taken by one who is under treatment; (*h*) reducing the price of the newer specific drugs, and (*i*) campaign against quackery. 2. An amendment of Paragraph 180 of the imperial crime punishment regulations is urged. 3. Supervision of prostitution, the burden of which shall hereafter fall on the medical man and not on the police. 4. Enforcement of the law of Oct. 28, 1905, and the ministerial edict of Dec. 11, 1907. 5. Keeping the prostitutes off the streets and out of public places, and segregating them for moral as well as police reasons.

LONDON LETTER

LONDON, Jan. 15, 1917.

The War

NEW FOOD REGULATIONS

Lord Devonport, the food controller, has issued six orders regulating the use of bread, sugar and other staple foods. It is the duty of the food controller to regulate the supply and consumption of food in such manner as he thinks best for maintaining a proper supply of food, and to take such

steps as he thinks best for encouraging the production of food. The first of the orders makes an important extension of the two existing flour and bread orders, under which millers are now required to extract from wheat a percentage of flour averaging 76 (as stated in a previous letter to THE JOURNAL). Under the new order, every miller will be required to add to the prescribed percentage a further percentage of not less than 5, either by a further milling of wheat or by the addition, at his option, of flour derived from barley, maize, rice or oats. He may add yet another voluntary 5 per cent. (making 10 per cent. in all) in addition to the compulsory 5 per cent. With regard to the milling of grain other than wheat, it is stated that barley and rye present no difficulties. Existing machinery, however, will not mill maize or oats at the same time as it mills wheat, and the admixture of maize or oats with wheat will probably have to be made in the form of flour. A wheat (restriction) order prohibits the use of wheat for any purpose except that of seed or of making flour, and thus makes illegal the feeding of wheat to animals. The object is, of course, to reserve wheat for human consumption. A good deal at present is being dissipated in other directions, particularly in the feeding of stock, and it is necessary to check this waste. An exception is made to the order in respect of "tailings, screenings and damaged wheat unsalable for milling." The food controller now prohibits entirely the use of any grains required for food or feeding-stuffs, or any of their products, for the purpose of food for game birds. It is felt that with the present emergency the rearing of pheasants and indulgences of this kind cannot be continued. The manufacture of extravagant sweets is stopped. A maximum retail price of 6 cents an ounce for chocolates and 4 cents an ounce for other sweetmeats is fixed. The price in each case includes the price of any covering in which the sweets are sold. The use of sugar or chocolate for the external covering of cakes, pastry or similar articles is prohibited. During 1917 no manufacturer will be allowed to use for sugar confectionery or chocolate more than 50 per cent. of the amount so used by him in 1915. The use of winter milk in the manufacture of chocolate is prohibited. The export of oats from Ireland is prohibited except under license. The price to be paid to growers for potatoes is $40 a ton for the first quality in January and February, with a rising scale attaining a maximum of $45 for later months. The maximum price for the best seed potatoes is to be $60 a ton.

ACCUMULATED FATIGUE IN WARFARE

The second interim report of the British association committee, of which Prof. J. H. Muirhead is chairman, to investigate fatigue from the economic standpoint contains an interesting section by Dr. T. G. Maitland on accumulated fatigue in warfare. The breakdown resulting from long-continued trench strain, while soon recovered from after a period of rest, leaves the quality of the soldier's work on his return to activity impaired; his aim is less good, his decision less prompt. The hope of obtaining an ideal working day for each unit is incapable of realization, as the strain in the field varies with the occasion and depends on such mutable factors as sleep, food, noise and nervous strain. With the present greater ability to supply reinforcements, strain can be diminished as well as the actual fighting units more often replaced, and in this way an opportunity is given for what Dr. Maitland calls a "growing delicacy of perception in the anticipation of the breaking point." From a military standpoint the most important item is the large class of combatants who do not collapse in the field but return from the lines with extreme pallor, a low blood pressure, and a *faiblesse irritable* shown by the restlessness of hands and feet. In these cases fatigue has gone slightly beyond the possibility of sound physiologic recuperation. To reduce the incidence of such cases, which are an encumbrance, the hours in the fighting line have been lately diminished. The ultimate sequel of such long-continued fighting strain has been seen by Dr. Maitland in Serbian soldiers who have lived through six years of nearly continuous Balkan War and many of whom show marked arteriosclerosis. He was able in most cases to exclude the action of mineral poisons, alcohol and acute specific toxins, and to establish the production of fibrosis in the arteries from hard work alone.

Another Death from a Salvarsan Substitute

Some weeks ago in describing a death due to kharsivan (THE JOURNAL, Sept. 30, 1916, p. 1030) I stated that the coroner of southeastern London, who held the inquest, said that he had had in his district three deaths from salvarsan or its substitutes within a short period. After a brief interval the following case, again in the same district, has occurred at Guy's Hospital. A man, aged 33, a tram conductor, was admitted with syphilitic meningitis of the spinal cord. He was given an intravenous injection of arsenobenzol, the French substitute for salvarsan. He had been carefully prepared and the operation lasted three quarters of an hour. A rather small dose, 0.04 gm., was injected intravenously, and the patient died suddenly two hours later. Dr. Spilsbury, pathologist, who made a postmortem examination, said he found a large tumor in the front part of the brain, and extensive softening of the brain. Death was due to coma from disease of the brain, accelerated by the administration of arsenobenzol. The patient was really in a very serious condition, but the exact nature and extent of the disease of the brain could not be easily diagnosed. The dose of arsenobenzol given was the usual dose, but, if anything rather small. The witness was afraid there was a danger of fatal results occasionally, but more often when there was disease of the brain. He thought every care was exercised in the administration of the drug, which was one of the best known remedies. It was similar to kharsivan, the English substitute, and was being used with most beneficial results in a large proportion of cases. The jury returned a verdict of death by misadventure.

The War and Public Health

In his report for 1915-1916, Dr. Arthur Newsholme, health officer of the Local Government Board, states that the war has directed attention to means for improving the health of mothers and of their children during the first five years of life. During 1915, work with this object was largely augmented. The need for greater effort to save child life is shown by the markedly lower natural increase of population in 1915 than in 1914. In the former year there were 362,354 more births than deaths in England and Wales. Last year this excess of births over deaths was only 252,201. There were 64,569 fewer births and 45,584 more deaths in 1915 than in 1914. In 1915 as many as 98,477 infants died in their first year after birth, and 55,607 died at ages of from 1 to 5. Dr. Newsholme says that there is no insuperable difficulty in reducing the total deaths in childhood to half the present number. At the end of last March about 1,000 health visitors had been appointed by local authorities. This means one health visitor approximately to 800 births annually. A steady approach is being made to the standard of one health visitor to 500 births, which was laid down as desirable in his memorandum of November, 1915. So far as infectious diseases are concerned, with the single exception of measles, the record of 1915, like that of 1914, remained favorable. Smallpox heretofore has failed to gain more than a temporary footing in any district. Dysentery, notwithstanding the return to this country of many soldiers recovering from this contagious and relapsing disease, has not spread. In both the civil and the military population typhus has failed to spread; and the amount of typhoid fever has been so small as to inspire fresh hope that this disease, like typhus, will soon be counted among the almost extinct diseases of this country. There have been no cases of plague or cholera. Cerebrospinal fever showed much activity, and special work was undertaken, both military and civil, to control its spread and to investigate its natural history. Acute anterior poliomyelitis occurred sporadically in this country during 1915. Tuberculosis work has been greatly restricted by the war.

Reference is made to the national scheme for the diagnosis and treatment of venereal diseases, which promises to be among the most successful public health work of the early future. As the nonrecommendation of compulsory notification by the royal commission has been criticized, Dr. Newsholme recalls that in the memorandum which he presented to that body he emphasizes the following considerations, to which further inquiries have led him to attach increased importance: Even if compulsory notification of these diseases could be enforced—a very doubtful point—the consideration of its enforcement should be postponed until after these conditions have been fulfilled: (*a*) Adequate arrangements must be available for the gratuitous treatment of all applicants suffering from venereal diseases in every administrative area. (*b*) There must be legal prohibition of treatment by unqualified persons so that all cases of early venereal disease receiving treatment will come under the observation of physicians. When these conditions have been fulfilled, patients will generally avail themselves of the facilities for treatment officially provided or will be treated by their own physician, and the question may legitimately arise whether the public safety is then adequately protected, or

whether notification is necessary to insure that every patient continues treatment as long as this is needed in the public interest. Attempts to secure the notification of venereal disease in adults under any of the forms in which it has been recently suggested would only diminish recourse to the treatment shortly to be provided in all our chief centers of population.

The heavy demands of the army for physicians has led to an extensive employment of women as health officers, assistant health officers, tuberculosis officers and resident medical officers in sanatoriums and fever hospitals. In this great national emergency their services have proved invaluable.

Selected Parents

A paper on "The Principle of Eugenics" was read to the Insurance Institute of London by Major Darwin, son of Charles Darwin and president of the Eugenics Education Society. Major Darwin compared the inborn qualities of a man to be a fixed anchor to which he is tied by an elastic cord. Everything that is possible should be done for the environment of the living—that is, in order to stretch these elastic cords; but it is foolish not to try to insure that the anchors of our successors on earth shall be cast on better ground. This is the aim of the eugenist, and, as this science is in its infancy, it cannot be expected yet to have accomplished great things. Few persons really care what happens to the nation long after they are dead, yet we must make an effort to insure that the innate qualities of our race shall continue to improve. The eugenist aims at substituting for the apparently blind selection of nature in the matter of parentage a conscious and rational selection.

The fact that offspring often differ from their parents is frequently held to tell against all eugenic reform; but modern science endorses the belief of every breeder of animals in the advantages of breeding only from the best stock. In regard to the methods of the stock yard, it must, however, be remembered that in the case of man his religion must be taken into account, whereas in the case of animals it need not. It is the lessons and not the methods of the stock yard which must be held in view. Another objection raised against all eugenic reform is the difficulty of deciding who had better and who had better not become a parent; but if attention be confined to the unquestionably fit and unfit there will be ample work to do. As to increasing the birth rate among the fit, we must rely largely on awakening the moral sense of our fellow countrymen and appealing to their spirit of patriotism. It is immoral and unpatriotic to limit the size of the family when both parents are fairly healthy, except to insure that there shall be an adequate interval between births, and that the family shall be brought up in comfort, but not in luxury, without external aid. Reforms in taxation might aid and reinforce this moral precept. As to diminishing the fertility of the unfit, the mental deficiency act, if properly administered, would be an example of what might be done, and somewhat similar measures are possible with regard to criminals, drunkards and paupers. What is mainly desirable is an investigation to ascertain if the danger to the nation from the present rapid multiplication of inferior stocks is as great as it appears to eugenists. If it be so, it must be dealt with with a fearless hand. But that is not yet. If the nation could see that its future is largely in its own hands, the battle would be half won. It is not the creation of the superman which eugenists are now aiming at; for that ideal receives but little support from science. The endeavor should be to increase the proportion of the existing higher types; and it is now doubly necessary thus to act in view of the slaughter of our fittest in battle.

PARIS LETTER

PARIS, Jan. 11, 1917.

Death of Professor Chauveau

French science has just suffered a great loss in the death of Prof. Jean Baptiste Auguste Chauveau, aged 89 years. He was born, Nov. 23, 1827, at Villeneuve-la-Guyard (department of Yonne). Chauveau entered l'Ecole vétérinaire d'Alfort at 17, leaving it at 20 to become chef de service at l'Ecole vétérinaire de Lyon. A considerable part of his professional life was spent there, first as professor of anatomy and physiology, then as director, to which position he was appointed in 1875. Two years later, i. e., at the age of 50, he secured his degree of doctor of medicine. Afterward he occupied the chair of general pathology at the Museum of Natural History of Paris; he also was general inspector of veterinary services.

It was as a physiologist that Chauveau became known. In collaboration with Marey, he invented and put into practical use the method of registration of physiologic movements and especially that of the cardiac rhythm. In pathology, tuberculosis was one of the subjects of chief interest to him. He was the founder and director of the *Revue de la Tuberculose*. He also directed the *Journal de Physiologie et de Pathologie Générales*. A member of l'Académie des Sciences since 1886, Chauveau entered l'Académie de Médecine in 1891 and became its president in 1913.

The War

MEDICAL EXAMINATION OF CANDIDATES FOR MILITARY AERONAUTIC SERVICE

By reason of the disadvantages presented by candidatures for this service not justified by sufficient physical aptitude, the undersecretary of state of the military health service has warned physicians in charge of the aviation depots to comply rigorously in the examinations with instructions concerning the physical aptitude of the aviator who is to enter the service. Moreover, on the arrival of officers at the aviation school, or of soldier aviators at the aviation depots, they must undergo examinations by two physicians. At the second examination, which shall be thorough, the attention of the specialists shall be drawn particularly to the necessity of ascertaining the absolute integrity of the respiratory, circulatory and renal functions. Careful attention shall be given to discerning organic from inorganic cardiac murmurs. Aspirants who present arrhythmia or permanently slow pulse (Stokes-Adams syndrome), tachycardia, Basedowan tachycardia, or extrasystolic arrhythmia will be excluded from service only when connected with an organic lesion of the heart. By way of compensation, the following disorders of cardiac rhythm will not constitute contraindications, when applications are made for positions as student pilots: total bradycardia, emotive tachycardia, tachycardia due to physical exercise or respiratory arrhythmia. All cases presenting emotivity with nervous instability, however, shall be excluded. Physicians are to study the health of the students in training by means of repeated examinations, and they are especially urged to study the arterial pressure of the aviators with the sphygmomanometer. This practice may be of much value in the course of training, as well as in obviating the dangers of overtraining. In a general way, aviation tends to produce a lowering of the highest arterial pressure even when the minimum pressure remains normal, as when the aviator is not in flight. This lowering of pressure is especially appreciable in subjects little or moderately trained. Overtraining may cause a marked lowering of pressure even in aviators inured to the service.

LARGE ABDOMENS (PAUNCHES) AMONG THE SOLDIERS

Drs. Désiré Denecheau and Henri Mattrais have observed disorders characterized by enormous abdomens without any trace of organic trouble, save a slight colitis readily relieved by simple flexion of the thighs. The origin of this disorder is traced back to a peculiar action of the diaphragm noticed in patients thus affected. It appears like a phenomenon of the motor order which can be produced, as well as relieved, at will. In the estimation of Denecheau and Mattrais it is brought about by digestive troubles common in colitis; aerophagia also contributes to the condition, although it is not believed to be the only cause. Briefly, this trouble is analogous to the nervous abdomen frequently observed in those whose nerves are overwrought by fright. It should not, however, be the cause of discharge from duty, much less, invalidation at half pay.

Marriages

BERNARD SAMUEL STRAIT, M.D., Penn Yan, N. Y., to BARBARA FANNIE KUNTZ, M.D., of South Williamsport, Pa., January 15.

GEORGE LOUIS STEELE, M.D., West Springfield, Mass., to Miss Vera Gertrude Colburn of Bangor, Me., Nov. 30, 1916.

PAUL THEODOSIUS FERRER, M.D., to Miss Minnie Elizabeth Hoehl, both of Port Chester, N. Y., Dec. 31, 1916.

PAUL E. BETHARDS, M.D., to Miss Florence Freeman, both of Toledo, Ohio, at Brockton, Mass., January 17.

CLAUDE GRIFFIN, M.D., to Miss Caroline Claire Stewart, both of Carrollton, Ga., Dec. 23, 1916.

GEORGE CERIO, M.D., Rome, Italy, to Miss Mabel Norman of Newport, R. I., January 20.

Deaths

Henry Theodore Bahnson, M.D., Winston-Salem, N. C.; University of Pennsylvania, Philadelphia, 1867; aged 71; a Fellow of the American Medical Association; a Confederate veteran; local surgeon of the Southern Railway System; president of the board of surgeons; chief surgeon of the Winston-Salem Southbound Railway Company; once president of the Medical Society of the State of North Carolina; a member of the American Public Health Association; president of the state board of health; secretary of the state board of medical examiners; a member of the board of directors of the Morganton State Hospital; died at his home, January 16, from angina pectoris.

Pearce Kintzing, M.D., Baltimore; University of Pennsylvania, Philadelphia, 1887; aged 55; a Fellow of the American Medical Association; chief physician to the Franklin Square Hospital, Baltimore; professor of anatomy and surgery in the Women's Medical College, Baltimore, from 1890 to 1897; professor of practice of medicine and diseases of the heart, and clinical medicine in Maryland Medical College from 1899 to 1901, and since 1904 a director and trustee of the Maryland Medical College; died at his home in Baltimore, about January 31.

Frank Sidney Fielder, M.D., New York; College of Physicians and Surgeons in the City of New York, 1892; aged 50; a Fellow of the American Medical Association and New York Academy of Medicine; demonstrator of anatomy in Cornell University Medical Department; attending pediatrist to Bellevue Hospital, outpatient department; assistant surgeon, United States Navy, during the Spanish-American War; author of several textbooks on diseases of children; died at his home, January 24, from pneumonia.

Dexter Boylston Farnsworth, M.D., Springfield, Mo.; Rush Medical College, 1877; aged 67; formerly a Fellow of the American Medical Association; a member of the Missouri State Medical Association; a specialist on diseases of the eye, ear, nose and throat; died at his home, January 22. At a special meeting of the Greene County Medical Society, January 23, it was decided to postpone the annual banquet of the association on account of the death of Dr. Farnsworth.

Francis A. Smith, M.D., Rock Island, Ill.; Pulte Medical College, Cincinnati, 1891; aged 64; formerly of Zanesville, Ohio; local surgeon for the Baltimore and Ohio Railroad, and a member of the Zanesville Board of Education; for six years head physician for Ohio of the Modern Woodmen of America, and since 1903 chairman of the board of supreme medical directors of that organization; died at his home, January 21, from cerebral hemorrhage.

James R. Barnett, M.D., Neenah, Wis.; Rush Medical College, 1868; aged 74; a Fellow of the American Medical Association; and at one time president of the State Medical Society of Wisconsin; for four years a member of the state legislature; a veteran of the Civil War; supreme medical examiner of the Equitable Fraternal Union; died at his home, January 30, from senile debility.

William A. Young, M.D., Newport, Ky.; Medical College of Ohio, Cincinnati, 1893; aged 46; formerly a member of the Kentucky State Medical Association; local surgeon for the Chicago, New Orleans and Texas Pacific Railroad; surgeon to the Speer's Memorial Hospital, Dayon, Ky.; health officer of Campbell County for eight years; died in the Speer's Memorial Hospital, December 21, from multiple sclerosis.

Frederick W. Schmidt, M.D., Riverdale, Chicago; Northwestern University Medical School, 1885; aged 55; formerly a Fellow of the American Medical Association and a member of the American Association of Railway Surgeons; local surgeon for the Illinois Central System; died at his home, January 31, from septicemia, after an illness of one year.

Thomas Jackson Thompson, M.D., San Diego, Calif.; College of Physicians and Surgeons in the City of New York, 1872; aged 73; for seven years deputy health officer of the port of New York, and later for eight years an officer of the U. S. Public Health Service in Japan; died at his home in Kensington Park, San Diego, January 10.

Jacob S. Newcomer, M.D., Chicago; College of Physicians and Surgeons, Chicago, 1893; aged 54; for many years a practitioner of South Dakota and an officer of the United States Indian Service; senior consulting physician of the Contagious Diseases Hospital of Chicago; died at his home, January 27, from nephritis.

Melanchthon C. Porter, M.D., Topeka, Kan.; College of Physicians and Surgeons, Chicago, 1890; aged 54; a Fellow of the American Medical Association; professor of surgery in the University of Kansas; formerly surgeon to the Union Pacific Railway, and health officer of Clay Center; died at his home, January 30.

William H. Winterbotham, M.D., Salina, Kan.; College of Physicians and Surgeons, Keokuk, Iowa, 1872; College of Physicians and Surgeons, Chicago, 1884; aged 70; formerly a Fellow of the American Medical Association; a member of the Kansas Medical Society; died at his home, January 21, from influenza.

George Wilbur Crawhall, M.D., Seattle; Rush Medical College, 1890; University of Pennsylvania, Philadelphia, 1896; aged 54; formerly a Fellow of the American Medical Association; a member of the Washington State Medical Association; died at his home, January 8, from myocarditis.

Benjamin F. Farley, M.D., York, Neb.; Rush Medical College, 1870; aged 73; formerly a Fellow of the American Medical Association, and once vice president of the Nebraska State Medical Association; a veteran of the Civil War; died at his home, January 17, from pneumonia.

Matthew O. Ricketts, M.D., St. Joseph, Mo.; University of Nebraska, Omaha, 1884; aged 60; a colored practitioner of St. Joseph; a member of the Nebraska State Legislature from 1893 to 1895; died in St. Joseph's Hospital, St. Joseph, January 15, from disease of the intestines.

Frank Beegle Statler, M.D., Johnstown, Pa.; Jefferson Medical College, 1889; aged 52; a Fellow of the American Medical Association; died in the Memorial Hospital, Johnstown, January 16, from abscess of the liver, ten days after an operation for appendicitis and cholecystotomy.

Arthur Alonzo Vibbard, M.D., Albany, N. Y.; New York Homeopathic Medical College, New York, 1894; aged 48; a member of the Medical Society of the State of New York; a specialist on diseases of the eye, ear and nose; died at his home, January 19, from pneumonia.

Horace B. Erb, M.D., Allentown, Pa.; Medico-Chirurgical College of Philadelphia, 1888; aged 58; a member of the Medical Society of the State of Pennsylvania; a specialist in diseases of the eye, ear, nose and throat; died at his home, January 24, from pneumonia.

Albert W. Sharp, M.D., Kettle, Ky.; University of Louisville, Ky., 1888; aged 59; a member of the Kentucky State Medical Association; a member of the legislature from the Adair-Cumberland District in 1914; died at his home, about January 2, from pneumonia.

Leon L. Moye, M.D., Vidalia, Ga.; Atlanta (Ga.) College of Physicians and Surgeons, 1902; aged 38; a member of the Medical Association of Georgia; formerly a member of the faculty of the Atlanta School of Medicine; died at San Antonio, Texas, January 14.

Stacy B. Collins, M.D., Seaford, Del.; Jefferson Medical College, 1876; aged 81; a member of the board of education and president of the board of health of Seaford; at one time a member of the state board of health; died at his home, January 17, from paralysis.

William Henry McLaughlin, M.D., Hedrick, Iowa; State University of Iowa, Iowa City, 1887; aged 53; formerly a Fellow of the American Medical Association; formerly a practitioner and druggist of Wester, Iowa; died at Springdale, Ark., January 13.

Sidney Smith Pruitt, M.D., Holland, Ky.; University of Tennessee, Nashville, 1886; Barnes Medical College, St. Louis, 1899; aged 55; formerly a member of the Kentucky State Medical Association; died at his home, January 10, from pneumonia.

Peter Alois Pfeffer, M.D., St. Louis; Barnes Medical College, St. Louis, 1908; aged 40; formerly a member of the Missouri State Medical Association; died in St. Anthony's Hospital, St. Louis, January 4, from septicemia, due to the bite of a dog.

Frederick Pollock Lane, M.D., New Haven, Conn.; Yale University, New Haven, 1904; aged 36; a Fellow of the American Medical Association; a member of the staff of the Hospital of St. Raphael; died at his home, January 14, from pneumonia.

Samuel J. Covert, M.D., Perrysville, Ohio; College of Physicians and Surgeons, Baltimore, 1882; aged 65; formerly a member of the Ohio State Medical Association; died at his home, November 8, from cerebral hemorrhage.

William H. M. Pearson, M.D., Council, Ark.; Memphis (Tenn.) Hospital Medical College, 1908; aged 37; formerly a member of the Arkansas Medical Society; died in Memphis, Tenn., November 15, from cirrhosis of the liver.

Isaac Jones Wells, M.D., Nanuet, N. Y.; University of Nashville, Tenn., 1865; Bellevue Hospital Medical College, 1866; aged 77; for many years an appraiser in New York Customs House; died at his home, January 20.

Rufus M. Lemon, M.D., Callaway, Va.; Kentucky School of Medicine, Louisville, 1877; aged 60; formerly a member of the Medical Society of Virginia; died at his home, October 28, from chronic nephritis.

Daniel Dwyer, M.D., Dunmore, Pa.; University of Michigan, Ann Arbor, 1891; aged 55; formerly surgeon of the Carbondale (Pa.) Emergency Hospital; died at his home, January 9, from cerebral hemorrhage.

Samuel J. Dewey, M.D., Breckenridge, Mo.; Washington University, St. Louis, 1871; formerly a practitioner and druggist of Springhill; a veteran of the Civil War; died at his home, January 10.

Hiram Munson Boyd, M.D., Manatee, Fla.; Columbus (Ohio) Medical College, 1877; formerly a practitioner of LaMoure, N. D.; died at his home, January 7, from carcinoma of the intestines.

Blin A. Harris, M.D., Norwich, N. Y.; New York University, New York, 1885; aged 54; a Fellow of the American Medical Association; died at his home, December 24, from heart disease.

John M. Cooke, M.D., Colorado Springs, Colo.; Rush Medical College, 1887; aged 63; a Fellow of the American Medical Association; died at his home, January 14, from cardiorenal disease.

Arvid Anderson, M.D., New Britain, Conn.; University of Michigan, Ann Arbor, 1892; aged 54; a Fellow of the American Medical Association; died at his home, January 10, from pneumonia.

Otto Appley, M.D., Damascus, Pa.; University of Buffalo, N. Y., 1880; aged 65; died in the Deer Park Sanitarium, Port Jervis, N. Y., recently, after an operation for disease of the intestines.

Jacob Bell Cornell, M.D., Somerville, N. J.; College of Physicians and Surgeons in the City of New York; 1878; aged 65; died at his home, January 20, from cerebral hemorrhage.

S. R. Wakefield, M.D., Eugene, Ore.; Willoughby (Ohio) Medical College, 1846; aged 95; died at the home of his son in Creswell, Ore., December 13, from senile debility.

Augustus W. Harrington, Esther, La. (license, Louisiana); aged 76; formerly a druggist and practitioner of New Orleans and Rayne, La.; died at his home, December 31.

Wilfred Cumbermede Hummell, M.D., Marysville, Ida.; State University of Iowa, Iowa City, 1895; aged 44; died at his home, December 3, from heart disease.

Herman F. Klemp, M.D., Topeka, Kan.; Hahnemann Medical College, Chicago, 1867; aged 79; died in a hospital in Topeka, January 16, from senile debility.

George Carleton Hale, M.D., New Bedford, Mass.; Vermont Medical College, Rutland, 1891; aged 74; died at the home of his son in Providence, January 13.

James Amos Fechtig, M.D., Baltimore; Hahnemann Medical College, Philadelphia, 1871; aged 68; died at his home, January 18, from pneumonia.

William Daniel Turvill, M.D., Madison, Wis.; Rush Medical College, 1882; aged 63; died at his home, October 15, from cerebral hemorrhage.

Walter John Colgan, M.D., Bridgeport, Conn.; University of Georgetown, Washington, D. C., 1913; aged 27; died at his home, December 1.

Relief B. Leeds Harding, M.D., Long Beach, Calif.; University of Michigan, Ann Arbor, 1884; died at her home, December 13.

Achibald Mitchell Galbraith, M.D., Hayward, Calif.; Cooper Medical College, San Francisco, 1889; died at his home, December 30.

John O. Aldrich, M.D., Bath, N. Y.; Eclectic Medical Institute, Cincinnati, 1883; aged 68; died at his home, January 18.

Duncan S. Allen, M.D., Seneca, N. Y.; Albany (N. Y.) Medical College, 1865; was found dead in bed, December 23.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

THE WILLARD PYORRHEA TREATMENT

Oren Oneal's New Brand of Quackery Is Barred from the United States Mails

After defrauding the public of amounts estimated by federal investigators at $75,000 a year by means of a fake "cure" for pyorrhea, F. W. Willard, M.D., D.D.S., has been denied the use of the United States mails. Willard himself seems to have been merely a hireling, for the official report of the government declares that the owner of the business was Dr. Oren Oneal. Some of our readers will remember Samuel Hopkins Adams' characterization of Oneal in his "Great American Fraud" series. At that time Mr. Adams said:

"If I were organizing an American Institute of Quack Specialists I should select Dr. Oren Oneal of Chicago as the first president. The artful plausibility of his advertising, his ingenuity in 'jollying along' the patient for his reluctant dollars, the widespread familiarity of his features through the magazine advertising pages, and, above all, his sleek and polished personality, make him the natural candidate."

And more to the same effect. Mr. Adams went further. He investigated Oneal's methods with some degree of thoroughness and when he brought to the quack's attention concrete examples of the disreputable methods employed, Oneal insisted that all Mr. Adams had against him were "a few technicalities." To this Mr. Adams responded:

"Dr. Oneal is proceeding on a false premise. I have nothing against him; I found him a singularly agreeable and frank specimen of the genus Quack. But every man, woman and child who reads his advertisements has this against him and against the magazines that print his stuff; that he is a maker of lying promises, a deliberate swindler, and a tamperer with blindness at the peril of others, for a fifty-dollar fee."

This was over ten years ago. Eye-quackery stock having, apparently, taken a slump, Oneal has turned to tooth-quackery and the blatant advertisements of the Willard concern have for some time been an offense against decency and honesty.

The company seems to have been incorporated under the Illinois law in 1912. At that time its president was one M. L. Katz who, it seems, had been engaged in the advertising business in a small way. Willard was at first vice president and secretary, while Oneal was the third member of the corporate body. In 1915, Oneal acquired Katz's interest and Willard became president with Oneal as general manager. It was brought out in the government investigation that Willard received a salary for his services as "president and medical advisor" and claimed to have nothing to do with the business management of the fakery which he stated was under the sole direction of Oneal.

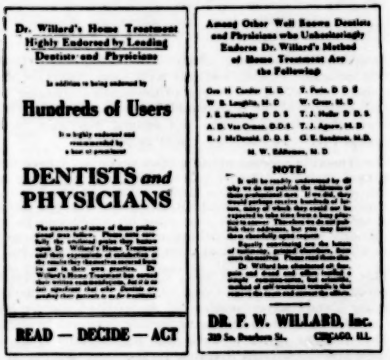
In July, 1916, Willard was called on by the government to show cause on or before Sept. 26, 1916, why a fraud order should not be issued against him and the company. On the date set, Willard and Oneal presented themselves at the office of the solicitor of the Postoffice Department having as their legal representative one W. M. Ketcham of Chicago. Ketcham apparently operates a business having the somewhat imposing name "Federal Advisory Association." Ketcham was a postoffice inspector for a number of years but in 1910 went into business for himself. The apparent object of the "Federal Advisory Association" is to furnish information, to those willing to pay for it, on the question of how they may use the United States mails without technically violating the law. From other material in our files, it seems that the "Federal Advisory Association" also essays to offer suggestions on the wording of "patent medicine" labels and cartons.

Francis W. Willard was graduated by Marion Sims College of Medicine, St. Louis, in 1891. This fact, verified by the

records, is admitted in one of the Willard booklets which states further: "After practicing medicine for some time he began the study of dentistry . . . and was graduated from the dental department of the Washington University." Curiously enough, however, another piece of advertising sent out by the Willard concern is a photographic reproduction of Willard's alleged diploma from the dental college. This diploma gives the date of his dental graduation as 1890—one year *before* he was graduated in medicine! According to our records, Willard was a dentist at Anna, Ill., for a number of years before coming to Chicago.

PYORRHEA CURED BY MAIL!

The business of the Willard concern was the sale on the mail-order plan of a so-called home treatment for pyorrhea or Riggs' disease. The "treatment" consisted of five remedies, three to be taken internally and two to be used in the mouth. The price asked was $5 for an amount sufficient to last thirty days if used in accordance with directions. Advertisements placed in such newspapers and magazines as were not above participating in the profits of this fraud were the mediums by which Willard-Oneal got in touch with their victims. The advertisements urged the reader to send for the free illustrated book and full information regarding the alleged treatment. Those that sent for it received a small booklet with circular matter and an order blank. The following quotations from the booklet indicate the character of the claims made for the treatment:


Dr. Willard's Home Treatment Highly Endorsed by Leading Dentists and Physicians

In addition to being endorsed by

Hundreds of Users

DENTISTS *and* PHYSICIANS

READ — DECIDE — ACT

Among Other Well Known Dentists and Physicians who Unhesitatingly Endorse Dr. Willard's Method of Home Treatment Are the Following:

NOTE:

DR. F. W. WILLARD, Inc.
209 So. Dearborn St. CHICAGO, ILL.

One of the circulars sent out by Willard professed to contain testimonials from "leading dentists and physicians" together with the names of such physicians who had "unhesitatingly endorsed" Willard's treatment. Here are two pages of this circular reproduced in miniature.

"I have originated and perfected my two-fold treatment—a treatment which is both local and constitutional—which has had and is having such remarkable success. I may claim in all modesty that I probably have treated more cases of Pyorrhea than any other dentist in this country, and the fact that I have been so universally successful proves that my treatment is correct. This is why you should pay close attention to one who knows the real and underlying cause of this trouble and who knows how and why it may be relieved by a simple, inexpensive home treatment."

"Dr. Willard's treatment is a two-fold or combination treatment. Dr. Willard's treatment consists of remedies for relieving and counteracting the local conditions in the mouth. The first essential is absolute cleanliness, and this is secured by ingredients, carefully and scientifically compounded for this special purpose that kill the surface germs and render the mouth tissues antiseptically clean. It was necessary to spend a great deal of time in experimentation before it was possible to produce a remedy that was at the same time very powerful as a germicide and cleanser and non-irritating to the delicate mucous membrane of the mouth. In addition to these qualities it contains the wonderful remedy, Emetine, which is claimed by many noted authorities to be an absolute specific for Pyorrhea. There is no alcohol or any harmful substance in it."

"The next step after antiseptically cleansing the mouth and gums is to combat the diseased condition existing in the gums themselves. This is accomplished by means of a medicated cream—extremely penetrating —that is gently rubbed into the gums with the finger. . . . Its effects are apparent almost at once and great relief may be confidently expected from the very start."

PLAYING ON FEAR

In all his "literature" Willard emphasized and kept ever before the mind of the reader the fact that some dental operations are accompanied by pain while his mail-order treatment was painless. For instance:

"Painful Operations and Treatment may Be Avoided."

"With Dr. Willard's treatment there is absolutely no suffering of any kind."

"Loose and diseased teeth may be restored to their normal health and firmness without the least discomfort."

"The gums may be healed without the slightest pain."

The entire scheme is well set forth by Judge W. H. Lamar, solicitor for the Postoffice Department, in his memorandum to the postmaster-general recommending the issuance of a fraud order. We quote freely from the memorandum:

"The booklet contains a number of testimonials from persons who are alleged to have used Dr. Willard's home treatment with success. Nearly all of the testimonials relate to cases of pyorrhea which were in advanced stages, and a careful reading of the entire booklet unquestionably leads the reader to believe that the treatment in question will cure practically all stages of the disease. In the booklet Dr. Willard gives the customer certain alleged symptoms of pyorrhea, and by the use of these symptoms and the symptom blank already referred to the patient 'diagnoses' his own case. Dr. Willard states:

SYMPTOMS OF PYORRHEA OR RIGGS DISEASE

It may be that you who read this are already in the clutch of this awful disease of Pyorrhea, sometimes called Riggs Disease, and that you now know it. If you are in doubt read the following pages, whereon the symptoms are enumerated and make sure. To conclude that Pyorrhea is not present when it is, and to neglect immediate treatment on that account, would indeed be a grave mistake, and one which you might very well repent for the balance of your life. Therefore, make sure. Then act AT ONCE.

Read the following and determine how far the disease has advanced in your case.

"Testimony of the experts at the hearing clearly shows that it is impossible for a patient to diagnose his own case, for the reason that a diagnosis of pyorrhea requires considerable clinical experience, and further that it is impossible for a dentist to diagnose pyorrhea without examination of the patient. Even when a personal examination is made it is possible for a dentist who is a beginner to mistake other mouth lesions for pyorrhea or vice versa. It appears that gingivitis, caused by lack of care in the mouth, and certain catarrhal conditions will often simulate pyorrhea.

"Reading of the booklet gives the impression not only that Dr. Willard's home treatment will cure practically all cases of pyorrhea, even in advanced stages, eliminate all pain in connection therewith, and save the patient large sums of money which he would otherwise have paid to dentists, but instills in the minds of patients who are in fact not suffering from pyorrhea in any form, fear of the disease.

THE "TREATMENT"

The ingredients in the Willard treatment were analyzed by the Bureau of Chemistry, Department of Agriculture, and the government's report gives a detailed analysis of the preparations. The findings of the government chemists can be summarized as follows:

DR. WILLARD'S K-3 TABLETS.—These were sugar coated tablets with a menthol flavor consisting essentially of the sulphocarbolates of zinc and calcium and a small quantity of the bismuth salt. Practically half of the tablet was made up of a mixture of starch, sugar and talc.

DR. WILLARD'S L-2 TABLETS.—These were light tan in color and contained washing soda, baking soda, Glauber salts and resins with a trace of colchicin. Over 38 per cent. of the tablets was a mixture of starch and talc.

LAXATIVE LIVER TONIC TABLETS.—These contained some laxative drug such as cascara, aloes or podophyllin. Over 70 per cent. of the tablet was made up of a mixture of chalk, gypsum, talc and sugar.

DR. WILLARD'S DENTOL.—These were tablets that the purchaser was told to dissolve in water and use the solution as

a mouth wash. Great stress was laid on the fact that the tablets contained emetin. The federal chemists found that over 96 per cent. of the tablets was made up of milk sugar and boric acid, while there were small quantities of menthol, thymol and eucalyptol. The total ipecac alkaloids (emetin) found by the chemists was only fifteen-hundredths of 1 per

WEAK EYES
SORE EYES
BLIND EYES
CROSS EYES
CURED
DOCTOR ONEAL
The Oneal Dissolvent Treatment
is a combination of mild and harmless medicines that dissolve all unnatural growths in and on the eye, such as Cataracts, Scums and Films, and strengthen the sight. In cases of Weak, Watery or Sore Eyes, and Diseases of the Optic Nerve, its curative value is remarkable.
MRS. S. C. WILLARD, of Libertyville, Ill., was cured of Blindness caused by Cataracts on both eyes. IRA MERCHANT, Bloomington, Ill., says "Dr. Oneal's treatment for Cataracts is wonderful."
Have cured thousands. No knife. No pain. No risk. Write to-day. New illustrated book, and professional opinion free. Describe your case carefully.
Dr. Oren Oneal
Suite 220, 52 Dearborn St., CHICAGO

Photographic reproduction reduced of an old-time advertisement of Oren Oneal in the heyday of his eye-quackery.

cent. The Willard concern claimed that paraform was also present in these tablets but it was not found.

DENTIFIRM.—This, Willard claimed, was "something absolutely new to the dental profession—a massage preparation for the gums of rare medicinal, as well as unusual cleansing qualities." The federal chemists found that it was a mixture of glycerin, starch, borax, chalk and soap flavored with oil of cloves and colored with a red dye!

Quoting from the solicitor's memorandum:

". . . The treatment contains a small amount of emetin, one of the constituents of ipecac, which in recent years has been brought forward as efficacious in the treatment of pyorrhea. A difference of opinion exists among the profession as to the value of emetin applied subcutaneously by injection into the arm or by the use of a blunt needle forcing the solution into the pus pockets which are found about pyorrheal teeth. The Willard treatment does not contemplate the use of emetin in either of these ways. Instead, a small amount of emetin is put in the 'dentifirm' paste with which the patient massages his gums. The expert witnesses agreed that even were emetin possessed of value its administration in such small doses as are contained in the Willard treatment and in the manner prescribed would have no effect."

The government called oral surgeons, pathologists and dentists, all of whom agreed that Willard's home treatment administered by the patient himself at his home would be ineffective to cure or relieve pyorrhea. An interesting feature of the government's investigation was the documentary evidence collected by Inspector D. F. Angier of the Chicago division, who, as readers of THE JOURNAL will remember, has done particularly valuable work in investigating other medical mail-order frauds. In the course of his investigations of the Willard concern Inspector Angier wrote to Willard, under various names, describing various mouth disorders, none of which indicated pyorrhea in any form. In reply to all of his inquiries, the inspector received in every case the booklet "How to Save Your Teeth, A Home Treatment for Pyorrhea" which has already been quoted from. He also received the customary form letters and circular matter soliciting orders for the Willard treatment.

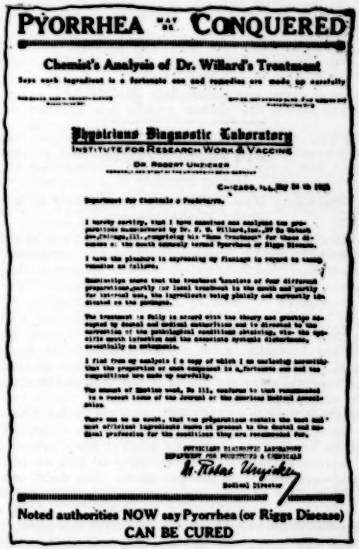
In one instance the inspector sent $1 for a "trial order" of the "treatment." The treatment was sent and thereafter Mr. Angier received a series of form letters urging him to purchase the full treatment which was offered at $4, instead of the usual $5. In the particular instance in which this "trial treatment" had been sent, Willard had already acknowledged in a letter to Inspector Angier that the case described was not one of pyorrhea but a condition which the Willard treatment was not claimed to benefit. To quote further from the solicitor's memorandum:

"All of the letters received by the inspector in the course of the correspondence were signed 'F. W. Willard, M.D., D.D.S.,' and even the form-letters have a decidedly personal tone calculated to lead the patient to believe that they were written by Dr. Willard. Dr. Willard on cross-examination stated that he had no knowledge of the letter in which a case was diagnosed as a mild case of pyorrhea and it appeared as a matter of fact that a rubber stamp signature was used. The rubber stamp was so excellent an imitation of Dr. Willard's signature that he himself on cross-examination was unable to state whether letters had been actually signed by him or stamped. There is no doubt that in all cases the patient thought he was receiving a personal letter from Dr. Willard, and further that it was the intention of both the owners of the concern and Dr. Willard to create the impression that the patient was receiving his personal attention and professional advice.

SUMMARY

The whole scheme is well described toward the end of the solicitor's memorandum thus:

"In summary, it may be said that the respondents are selling through the mails a worthless home treatment for pyorrhea to any one who will buy it, irrespective of whether


PYORRHEA MAY BE CONQUERED

Chemist's Analysis of Dr. Willard's Treatment

Physicians Diagnostic Laboratory
INSTITUTE FOR RESEARCH WORK & VACCINES

DR. ROBERT UNZICKER

Noted authorities NOW say Pyorrhea (or Riggs Disease)
CAN BE CURED

One of the traditions of mail-order quackery is that some sort of an analytical report should be published endorsing the "treatment" advertised. The Willard-Oneal concern held to the tradition. Here is a reproduction, greatly reduced, of a self-styled "analysis" of the Willard treatment issued by one "Dr. Robert Unzicker" who did business under the imposing title "Physicians Diagnostic Laboratory." So far as our records show, Unzicker is not a physician.

or not he has pyorrhea, or, if he has pyorrhea, irrespective of whether or not it has reached that incurable stage which they admit exists; that in order to increase their business

they are leading persons suffering from minor mouth disorders to believe themselves to be afflicted with pyorrhea, claiming it to be a 'loose term,' whereas in fact it has a definite medical significance; that the public has already been defrauded of several hundred thousand dollars through the operations of the respondents; and finally that if prompt steps are not taken to prevent further use of the mails by the respondents the public will not only be further defrauded, but those suffering from pyorrhea will be discouraged from securing proper treatment which might save the teeth if taken in time."

From the memorandum it seems that Willard and Oneal made a strenuous effort to continue taking in the $75,000 annually and submitted to the postoffice department a new set of advertising urging that they had completely modified the claims previously made. They stipulated that if permitted to continue in business they would not advertise their treatment as for pyorrhea or Riggs' disease nor use the mails to solicit money for the sale of a pyorrhea treatment. The solicitor of the Postoffice Department called attention to the fact that under the stipulations suggested, the Willard treatment could still be advertised and sold through the mails provided no mention was made of pyorrhea or Riggs' disease. As Willard-Oneal had claimed throughout the hearing that the "Willard Treatment" was specially designed for the relief of pyorrhea, the suggested stipulation was a virtual admission that its sale for such a purpose was fraudulent. The solicitor pointed out that it was difficult to understand why it should be deemed valuable for any other purpose than the one for which it was claimed to be specially prepared. The memorandum closed with the following recommendation:

"After a careful consideration of all of the circumstances of this case I am convinced that it is one in which the protection of the public demands the issuance of a fraud order . . . I find that this is a scheme for obtaining money through the mails by means of false and fraudulent pretenses, representations and promises, and therefore recommend that a fraud order be issued against the names appearing in the caption of this memorandum."

The fraud order was issued, Dec. 28, 1916.

Correspondence

Compulsory Health Insurance Unnecessary as a Public Health Measure

To the Editor:—In view of the fact that the propaganda for compulsory health insurance is made to rest largely on the assumption, which, however, is quite erroneous, that the health progress of countries under social insurance has been more pronounced or effective than the corresponding health progress of countries which have not established at least compulsory health insurance, such as the United States, Canada and Australia, or any one of the great South American republics, it may interest your readers to know that during the last twenty years the sanitary progress of the cities of New York and Berlin has been as follows:

Comparing the period 1888-1892 with the period 1908-1912, since there are no trustworthy data of a later date for the city of Berlin, it appears that the general death rate of New York decreased from 25.8 per thousand to 15.5, or 10.3 per thousand, equivalent to 39.9 per cent. The death rate of Berlin during the same period decreased from 20.9 per thousand to 15.1, or 5.8 per thousand, equivalent to 27.8 per cent. The average death rate of both cities during the period 1908-1912 was practically the same. It would therefore seem entirely erroneous to claim that the sanitary progress of the largest city of Germany was to a measurable extent affected by compulsory health insurance.

The mortality from pulmonary tuberculosis in the city of New York decreased from 32.4 per 10,000 during the first five years of the twenty-year period to 18.1, or 14.3 per 10,000, equivalent to 44.1 per cent. The corresponding decrease in the pulmonary tuberculosis death rate of Berlin was from 28.3 per 10,000 to 17.9, or 10.4 per 10,000, equivalent to 36.7 per cent. The actual as well as the relative decrease in the pulmonary tuberculosis death rate was therefore more pronounced in the city of New York, *without* compulsory health insurance, than in the city of Berlin, where practically the entire wage-earning population is subject not only to the provisions of the compulsory health insurance law, but also to the even more drastic provisions of a compulsory invalidity insurance law. It may be said in this connection that very little, indeed, has been done by sickness insurance societies in the direction of the prevention and cure of tuberculosis among wage earners. What has been done in this direction has been almost exclusively in connection with invalidity insurance, for the obvious reason that the comparatively short period during which medical attendance is provided would be of little, if any, real value in connection with the treatment of chronic or prolonged diseases.

The mortality from typhoid fever, which is perhaps the most sensitive index of sanitary progress, decreased in New York City from 2.5 per 10,000 to 1.1, or 1.4 per 10,000, equivalent to 56 per cent. The corresponding decrease in the typhoid fever death rate of the city of Berlin was from 1.4 per 10,000 to 0.3, or 1.1 per 10,000, equivalent to 78.6 per cent. The actual reduction in the typhoid fever death rate of the city of New York was therefore greater than the corresponding reduction in the typhoid fever death rate of Berlin, which, however, has now been reduced so low that the mortality is practically negligible. However, it requires to be considered that the city of New York has had to assimilate an enormous immigrant population, aside from the fact that large numbers annually go on vacation and contract typhoid fever in unsanitary resorts, etc. It is a safe assumption that a large portion of deaths from typhoid fever in the city of New York at the present time are cases contracted outside of the city.

An equally sensitive index of effective sanitary progress and control is the mortality from diphtheria and croup. The death rate from these diseases in the city of New York decreased from 13.3 per 10,000 to 3.2, or 10.1 per 10,000, equivalent to 75.9 per cent. The corresponding decrease in the death rate of Berlin was from 8.3 per 10,000 to 3.3, or 5.0 per 10,000, or 60.2 per cent. The mortality from diphtheria and croup is now almost exactly the same in the two cities, and it may safely be asserted that the reduction has been achieved in both cities without any reference whatever to compulsory health insurance.

A large amount of additional statistical and other evidence can be brought forward to prove that the sanitary or public health progress of the German Empire has not been in advance of corresponding progress made in this country or Canada or Australia. Since the death rate is practically proportionate to serious sickness rate, it is a safe conclusion that the general health conditions of this country, with particular reference to wage earners, are, broadly speaking, more satisfactory at the present time than at any time in the past, and that therefore the establishment of compulsory health insurance as a public health measure is wholly unnecessary.

FREDERICK L. HOFFMAN.
Statistician, Prudential Insurance Company, Newark, N. J.

Blood Transfusion

To the Editor:—In your answer to the inquiry of M. Y. D. regarding blood transfusion in THE JOURNAL, Nov. 25, 1916, it was stated that "in November, 1666, according to the diary of Samuel Pepys, blood transfusion from one dog to another was performed." I should like to amplify your perfectly correct quotation for the benefit of M. Y. D. and others interested in the subject.

It was in February, 1665, that Richard Lower, while working in Thomas Willis' laboratory at Oxford, transfused blood from one animal to another. Lower was "that expert anatomist" who had assisted Willis in his dissections of the brain and had drawn, with Christopher Wren, the later famous architect, some of the remarkable plates for Willis' celebrated book "Cerebri Anatome." It is thought that Wren first suggested the transfusion experiments following some infusion experiments which he had done in the Oxford laboratory.

Lower's demonstrations were carried out before several of the Oxford doctors and a few months later before the Royal Society in London. An account of Wren's early experiments with the help of Robert Boyle, the physicist, is found in No. 7 of the *Philosophical Transactions of the Royal Society* for Dec. 4, 1665, and Lower's transfusion before the Royal Society in No. 20, Dec. 17, 1666. Lower transfused first from vein to vein and later from carotid to jugular by the aid of a quill, using sheep for demonstration purposes. During that same year M. Denis and M. Gayant performed similar experiments in France. A letter from M. Denis is published in No. 25, May 6, 1667, of the *Transactions*.

Interesting discussions on the dispute which arose at the time as to the priority of transfusion are also found in the *Transactions* for May 6 and Oct. 21, 1667. It seems certain that as early as 1660 Wren, Lower and Boyle had carried out, at Oxford, experiments on infusion and later on transfusion of blood. Boyle injected opium (through a quill into a vein), stupefying an animal. It was not, however, until May 17, 1665, that a public demonstration of transfusion was held at the Royal Society in London. The Royal Society notes that "a Benedictine Fryer discoursed of it at M. de Monmours, ten years ago," but there is no more evidence to strengthen this French claim. The report of the Royal Society wisely concludes, "But whoever the Parent be, that is not so material as all that lay claim to this child should joyn together their efforts and cares to breed it up for the service and relief of human life, if it be capable of it; and this is the main thing aimed at and sollicited in this Discourse."

"In accordance with this sound advice transfusion experiments proceeded, and were soon carried out on human subjects. For instance, on November 23, 1667, transfusion was practiced in a medical case on one Mr. Arthur Coga at Arundel House, London, in the presence of 'considerable and intelligent persons,' by Dr. Lower and Dr. King, the blood of the sheep being used. Their report states that 'the man after this operation as well as in it found himself very well, and hath given his own Narrative under his own hand enlarging more upon the benefit he thinks he hath received by it than we think fit to own to as yet'" (Gotch, "Two Oxford Physiologists, Lower and Mayon," Oxford, 1908). The carotid of a sheep was connected to a vein in Coga's arm by a silver tube. The full report appears in the *Philosophical Transactions*, No. 30, Dec. 9, 1667.

HENRY VIETS, M.D., Oxford, England.

Lack of Efficient Teaching in Urology

To the Editor:—I have read, with interest and approval, Dr. Irvine's "Notes on the Teaching and Treatment of Syphilis" (THE JOURNAL, Dec. 30, 1916, p. 1987). I agree with him that medical colleges are not preparing their graduates to combat syphilis effectively, and that a social injustice is thereby perpetuated.

In urology, a like condition exists. In over ten years' service at the North Hudson Hospital, I have not found one intern who was really competent to treat gonorrhea or to use the catheter. And most of them came from New York medical schools, which certainly do not lack material for teaching clinical urology.

These men are familiar with the cystoscopic appearances of the bladder, and know the indications for and technic of such operations as nephrectomy and prostatectomy. They have been taught major procedures which few of them will ever have occasion or desire to perform, but not how to meet the every-day urologic problems of a general practice.

Not a few recent graduates, therefore, progressive in everything else, even syphilis, treat urethral disease as their forefathers did. For gonorrhea they prescribe the same old balsamics and gastro-irritants and the same astringent injections, spoiling their patients' stomachs and laying the foundations for infiltrations and strictures, but not actually curing the disease.

This is not the fancy of an alarmist. It is a sober estimate of existing conditions, based on a fair sized urologic practice. In the cities, conditions are better than formerly, owing to the great recent development of urology. Many city practitioners habitually refer their urethral patients to the urologist, and many patients go to him directly.

The safe and proper technic of urethral instrumentation and irrigation are a matter of manual training, to be acquired by plenty of actual work done under expert supervision. The genito-urinary clinics of our large medical centers offer more than enough material for practice.

The responsibility for this lack of training lies with the colleges.

C. L. DEMERITT, M.D., Hoboken, N. J.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

TREATMENT OF CEREBRAL HEMORRHAGE

To the Editor:—One of my patients, a woman, aged about 68, has partial paralysis of the left side due, I think, to cerebral hemorrhage. I should like to know the latest accepted treatment of this condition.

G. M. H., M.D., Lancaster, Ky.

ANSWER.—It is exceedingly difficult to advise regarding the treatment of a person without more complete details of history and physical findings, since each patient presents a special problem. Presumably this patient is partially paralyzed from "cerebral hemorrhage" with no other complications.

This is the commonest cause of the condition described by our correspondent. Embolism or thrombosis of cerebral arteries may also give a similar result. In general the treatment should consist of rest in bed immediately following the attack. The bowels should be moved if necessary with a mild cathartic. Good nursing care is important and adds to the comfort of the patient. In the days immediately following the onset of paralysis, the position of the patient should be changed from side to side at intervals. The use of inflated rubber rings and cotton pads will assist in preventing pressure necrosis of the skin of the back, heels, etc. Later in the course, massage and passive motion will aid in preventing contractures.

Other special features of the individual case may call for changes or additions in treatment. Arteriosclerosis is frequently accompanied by cardiac hypertrophy and increased blood pressure, and, in plethoric persons, bleeding has sometimes been advised to reduce blood pressure. Cerebral hemorrhage may, however, occur in persons in whom arteriosclerosis is not accompanied by greatly increased pressure. The possibility of syphilis as a cause of the arteriosclerosis should be investigated, and when it is found, iodids and later mercury are indicated. Small doses of iodids are often advised in nonsyphilitic arteriosclerosis.

Other causes of hemiplegia of central origin, such as tumors, in a person over 60, usually give rise to additional symptoms and physical signs which will be discovered in the course of the routine examination which should be made of every patient, no matter what the complaint.

While cerebral hemorrhage with resultant hemiplegia may often result fatally in the first attack, the patient may recover the use of the extremities to a surprising degree, and by living a quiet life with moderation in all respects, may exist in comfort for years.

INCOMPATIBLE DISEASES

To the Editor:—Can you give me the title of any books or articles on diseases incompatible to each other; that is, diseases which cannot exist in the human body at the same time?

F. W. S.

ANSWER.—The following is a list of articles on this subject:

Gerhardt, D.: Ueber günstige Beeinflussung chronischer Erkrankungen durch interkurrente Infectionskrankheiten, *Mitt. a. d. Grenzgeb. d. Med. u. Chir.*, 1912, **25**, 578-586.

Hutchinson, J.: Hunterian Lecture on the Laws of Partnership in Disease, *Lancet*, London, 1891, **2**, 860-864.

West, S.: Chorea Cured by Typhoid Fever, *St. Barth. Hosp. Rep.*, 1886, **22**, 224.

Moran, J. F.: Antagonism of Erysipelas in Disease, *Virginia Med. Month.*, 1894-1895, **5**, 59-66.

Bury, J. S.: Cases Illustrating the Apparent Beneficial Effect of One Disease on Another, *Med. Chron.*, 1907, **46**, 277-280.

Dufour, L.: Antagonisme entree la diphtérie et la fièvre typhoide, *Normandie méd.*, 1897, **12**, 440.

Discussion of Beneficial Effects of One Disease on Another, *Chir. Jour.*, 1898, **12**, 17, 57.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

CONNECTICUT: Regular: New Haven, March 13-14. Sec., Dr. Charles A. Tuttle, 196 York St., New Haven.

CONNECTICUT: Homeo.: New Haven, March 13. Sec., Dr. Edwin C. M. Hall, 82 Grand Ave., New Haven.

CONNECTICUT: Eclectic: New Haven, March 6. Sec., Dr. T. S. Hodge, 19 Main St., Torrington.

ILLINOIS: Chicago, Feb. 21-23. Sec., Dr. C. St. Clair Drake, Capitol Bldg., Springfield.

KANSAS: Topeka, Feb. 13. Sec., Dr. H. A. Dykes, Lehanon.

MAINE: Portland, March 13-14. Sec., Dr. Frank W. Searle, 776 Congress St., Portland.

MASSACHUSETTS: Boston, March 13-15. Sec., Dr. Walter P. Bowers, Room 501, No. 1 Beacon St., Boston.

VERMONT: Montpelier, Feb. 13. Sec., Dr. W. Scott Nay, Underhill.

Arizona July Report

Dr. John Wix Thomas, secretary of the State Board of Medical Examiners of Arizona, reports the written examination held at Phoenix, July 5-6, 1916. The total number of subjects examined in was 10; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 11, of whom 8 passed, including 1 osteopath, and 3 failed. The following colleges were represented:

College	Year Grad.	Per Cent.
PASSED		
College of Physicians and Surgeons, Los Angeles	(1916)	79.5
University of California	(1916)	80.6
Bennett Medical College	(1914)	78.1
Northwestern University	(1914)	85.6
Rush Medical College	(1915)	82
John A. Creighton Medical College	(1916)	75.7
University of Virginia	(1912)	79.4
FAILED		
Arkansas Industrial University	(1884)	51.6
University of Louisville	(1916)	73.2
Baltimore Medical College	(1913)	66.6

Utah July Report

Dr. G. F. Harding, secretary of the Utah State Board of Medical Examiners, reports the oral and written examination held at Salt Lake City, July 5-6, 1916. The total number of subjects examined in was 19; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 5, all of whom passed, including 1 osteopath. Five candidates were licensed through reciprocity. The following colleges were represented:

College	Year Grad.	Per Cent.
PASSED		
Rush Medical College	(1916)	87
University of Illinois	(1916)	87
Barnes Medical College	(1911)	76
Washington University	(1916)	81.9

College	Year Grad.	Reciprocity with
LICENSED THROUGH RECIPROCITY		
University of Colorado	(1914)	Colorado
George Washington University	(1910) (1911)	Dist. Colum.
Iowa College of Physicians and Surgeons	(1892)	Nebraska
University of Virginia	(1897)	Idaho

New York September Report

Mr. H. H. Horner, Chief, Examinations Division of the New York State Board of Medical Examiners, reports the written examination held at Albany, Buffalo, New York and Syracuse, Sept. 19-22, 1916. The total number of subjects examined in was 8; total number of questions asked, 80; percentage required to pass, 75. The total number of candidates examined was 146, of whom 89 passed and 57 failed, including 1 osteopath. Fourteen candidates were licensed through reciprocity, three were granted reregistration licenses, and 1 candidate was licensed because of eminence and authority in the medical profession. The following colleges were represented:

College	Year Grad.	Total No. Licensed
PASSED		
University of Alabama	(1909)	1
Yale University	(1912) (1916)	2
Georgetown University	(1914)	1
Johns Hopkins University	(1910,2) (1911) (1914)	4
University of Maryland	(1915,2) (1916,2)	4
Harvard University	(1914) (1916)	2
Detroit College of Medicine	(1911)	1
Albany Medical College	(1914,2) (1915,3) (1916,4)	9
Columbia University	(1909) (1914,2) (1915,3) (1916,7)	13
Cornell University	(1914) (1915,2) (1916,3)	6
Fordham University	(1913) (1915,2) (1916,4)	7
Long Island College Hospital	(1915) (1916,5)	6
New York Homeopathic Medical College and Flower Hospital	(1914,2) (1915,4) (1916,5)	11
Syracuse University	(1916)	1
University and Bellevue Hospital Medical College	(1913) (1914) (1915,5) (1916,3)	8
University of Buffalo	(1915) (1916,2)	3
Jefferson Med. Coll. of Philadelphia	(1912) (1913) (1916,2)	4
University of Pennsylvania	(1916)	1
Woman's Med. Coll. of Pennsylvania	(1914) (1915)	2
University of Vermont	(1915)	1
University of Toronto	(1914)	1
McGill University	(1915)	1
FAILED		
Chicago College of Medicine and Surgery	(1914)	1
Illinois Medical College	(1898)	1
Northwestern University	(1913)	1
University of Louisville	(1914)	1
Tulane University of Louisiana	(1911)	1
Baltimore Medical College	(1913)	1
College of Physicians and Surgeons, Baltimore	(1912)	1
University of Maryland	(1916)	1
Harvard University	(1913)	1
Tufts College	(1905) (1915)	2
University of Michigan Medical School	(1909) (1916)	2
Albany Medical College	(1912) (1914) (1915) (1916)	4
Columbia University	(1914) (1915,2)	3
Fordham University	(1913) (1914) (1916,3)	5
Long Island College Hospital	(1915)	1
New York Homeopathic Medical College and Flower Hospital	(1914,3) (1915,5) (1916,4)	12
New York Med. Coll. and Hosp. for Women	(1913) (1915)	2
Niagara University	(1898)	1
University and Bellevue Hospital Medical College	(1916)	1
University of Buffalo	(1914)	1
Jefferson Med. Coll. of Philadelphia	(1908) (1912) (1916)	3
Medico-Chirurgical College of Philadelphia	(1915) (1916)	2
Woman's Medical College of Pennsylvania	(1916)	1
University of Vermont	(1912) (Yet)	2
University of Toronto	(1916)	1
University of Bonn, Germany	(1889)	1
University of Naples, Italy	(1905)	1
Syrian Protestant College, Beirut	(1912)	1
University of St. Joseph, Beirut	(1894)	1

College	Year Grad.	Reciprocity with
LICENSED THROUGH RECIPROCITY		
University of Maryland	(1914)	New Jersey
Boston University	(1900)	New Jersey
Fordham University	(1915)	New Jersey
N. Y. Homeo. Med. Coll. and Flower Hosp.	(1893) (1915)	New Jersey
	(1915)	Virginia
Syracuse University	(1913)	Delaware
Cleveland Homeopathic Medical College	(1905)	Ohio
Starling-Ohio Medical College	(1914)	Ohio
Western Reserve University	(1904)	Ohio
Hahnemann Med. Coll. and Hosp. of Philadelphia	(1906)	Virginia
Medico-Chirurgical College of Philadelphia	(1904)	New Jersey
University of Virginia	(1915)	Virginia
University of Palermo, Italy	(1902)	Michigan

Stronger Tests for Drugless Healers

The Illinois State Board of Health has ruled that drugless healers are to be given the same examination as physicians, except in surgery, obstetrics, materia medica and therapeutics. Drugless healers are not authorized by law to practice operative surgery or obstetrics, nor are they to use drugs or medicines internally in their practice. Examination papers on "practice" are to be graded by members of the various schools of healing selected by the state board of health for that particular purpose. Formerly drugless healers were given a comparatively simple examination in anatomy, chemistry, physiology, pathology and histology, symptomatology, and hygiene. The examination now covers seven groups of subjects: anatomy; chemistry, etiology and hygiene; physiology and neurology; pathology and bacteriology; physical diagnosis, ophthalmology and otology, and pediatrics; gynecology, laryngology, rhinology and medical jurisprudence; and practice.

New Jersey and Chiropractic Colleges

The Department of Public Instruction of New Jersey states that the New York School of Chiropractic, located in New York, and supposedly operating under a New Jersey charter, has not been chartered or registered in New Jersey, and that the New Jersey College of Chiropractic, located at Newark, N. J., although chartered in the state, was, on May 1, 1915, refused permission by the state board of education to grant degrees.

Book Notices

THE TREATMENT OF DIABETES MELLITUS. With Observations on the Disease Based on 1,000 Cases. By Elliott P. Joslin, M.D., Assistant Professor of Medicine, Harvard Medical School. Cloth. Price, $4.50 net. Pp. 440, with illustrations. Philadelphia: Lea & Febiger, 1916.

"In writing this book," the author says, "I have tried to record those facts which have proven of service to me in the treatment of diabetes," and it is in this sense that the title gives a true index of the scope of the work; for the writer has by no means limited himself to the discussion of those things which in a narrower sense would be classified under the heading of treatment. It represents in reality a summation of the work done by Dr. Joslin and his co-workers on the subject of diabetes. "For the benefit of my patients," he adds, "it has seemed worth while to summarize my work with them during the last eighteen years, and I have honestly tried in these pages to let the 400 fatal cases tell their useful lessons to the 600 living."

Whereas in addition to such able and well known foreign treatises as those of Naunyn, Lépine and von Noorden, there have appeared within the last four years three other volumes on diabetes from the pens of American writers, while a fourth is in course of preparation, making in all five American books on diabetes within as many years, one may properly ask what new or special phase of the subject or what improvement in the method of exposition this one is designed to present. "I would not have wished to write a book on diabetes three years ago," says Joslin; "today it is a pleasure and an inspiration because the improvement in treatment is beyond question. The introduction of fasting and the emphasis on physical exercise by Dr. F. M. Allen, of the Rockefeller Institute for Medical Research, has decidedly changed the outlook for this class of patients. It is encouraging to be able to report that during the last year the mortality of my patients was approximately 20 per cent. lower than for the previous years." A fresh presentation of the subject of treatment, with particular reference to the use of inanition and exercise, as taught by Allen, is, then, the distinguishing feature of this book.

There are seven sections: the first (sixty pages), after preliminary definitions and distinctions between diabetic and other forms of glycosuria, in which prominence is given to the views of Allen, is devoted to statistics relating to diabetes. Conditions relating to diabetes within the United States receive a fuller exposition in this section than they have yet had elsewhere, and some new ground is covered. It will be found of value particularly to American readers for reference purposes. The second section of the book (seventy-seven pages), entitled "Important Factors in the Treatment of Diabetes," consists of subsections devoted to a variety of subjects, such as: "Naunyn's Conception of Diabetes Mellitus"; "Allen's Hypothesis: Diabetes—A Weakness of the Pancreatic Function"; "Is the Tendency of the Diabetic Glycosuria to Increase?"; "If the Urine of the Diabetic Patient is Sugar-Free, the Tolerance for Carbohydrates usually Improves"; "Hyperglycaemia" (twelve pages), based largely on original observation and recent American literature; "Blood Fat" (five pages), written by Prof. W. R. Bloor of the Harvard Medical School, and "Metabolism in Diabetes" (thirty pages), containing a discussion of the total metabolism in diabetes, observations on the respiratory quotient, and a consideration of contingent topics based on the studies of Benedict and Joslin on individuals in the fasting and diabetic states. This section ends with a chapter on acidosis. In the sense that all obtainable knowledge of diabetes may prove of service in the treatment of cases, the material of this section bears on treatment, some of it directly. But it is of interest more especially from the standpoint of physiology. Some features of this section will be referred to again. The third section is on methods of examining the urine, blood and respirations. The fourth section (twenty-eight pages) is devoted to principles of dietetics with special reference to diabetes. The fifth section (130 pages) takes up the treatment proper.

The use of inanition and the views of Allen are fully presented, with many citations of cases. The sixth section, referred to in the preface as a "diabetic's primer," has a content indicated by the following captions: "What Every Diabetic Should Know"; "Directions for Nurses in Charge of Diabetic Patients"; "A Diabetic History Chart for the Use of Institutions and Physicians"; "Chart for Dietary and Urinary Records"; "Actual Diets Employed to Render Patients Sugar-and-Acid-free"; "Hospital Treatment"; "Ambulatory Treatment," etc. The last section contains food and diet tables, recipes, menus, methods of recording hospital diets, and tables of equivalents.

The book as a whole forms a compact, well printed volume written in an intimate, readable style. It is interesting to note a transition in the character of the writer's work from the earlier to the later periods; for the first part of the book, patterned unmistakably after Naunyn and reflecting a time in the development of American medicine when statistical clinical studies of the Oslerian type prevailed, contrasts noticeably with the latter sections, based largely on the yield of an intensive experimental study. If in the past American writers have had just cause to complain of a neglect of their work by foreigners, they will have none here. The American literature receives all the credit due it, not to say more. That diabetes implies a weakness of the pancreatic function is an idea ascribed to Allen.

The discussion of treatment based largely on the extended use of inanition and the emphasis on physical exercises by Allen is full, clear and illumined by many original comments based on a wealth of clinical material, handled with system and scrupulous exactness of detail. It is a significant contribution to clinical medicine. Noteworthy are the specific directions for the graduated increase of diets without causing recurrence of symptoms in cases of severe diabetes which have been rendered sugar-free by fasting. The method of building up first the carbohydrate of the diet, then the protein, then the fat, the emphasis laid on the importance of finding and not exceeding the tolerance for fat, and of keeping the total food allowance within narrow enough limits will doubtless explain to many who have failed to keep patients with severe diabetes free of symptoms why they have failed. On the other hand, out of 184 cases treated in twenty-four years by fasting, there were thirty-one fatalities, twenty-one of the patients dying in typical coma, the rest with complications such as coma and gangrene, 1; uremic coma, 1; appendicitis, 2; carbuncle, 1; pulmonary embolism, cancer, anuria, tuberculosis, each 1; cardiac, 2. Dr. Joslin, however, does not admit that in any of these the fasting treatment, properly carried out, hastened the end. In this connection it should be said that fasting practiced by other clinicians, and even by some who are not open to criticism on the score that they have not carried it out intelligently, has nevertheless been observed to shorten life in a certain small fraction of cases. It will doubtless continue to be felt by some that human individuals in certain conditions can be injured or killed by withholding food and that if such persons, in addition to their other ailments, should happen to have a deficient pancreatic function besides, they may still be injured by fasting. This might be said to apply to some pluriglandular complexes with goiter and to all end-stages of inanition itself. It is to be regretted that in this book the writer has not set out with equal clearness, over against the indications for inanition, those situations in which it is no longer of any value or in which it may perhaps prove to be contraindicated.

The sections devoted to topics of interest chiefly from scientific points of view are useful especially because they contain many new and valuable clinical data and convenient collections of the recent published work of American writers.

This book will enable any physician who has diabetic patients under his care, and who will carry out the directions given, to obtain better results with his cases than are obtained by ninety-nine out of a hundred practitioners at the present time. It may be placed in the hands of nurses and patients with the result that the physician will receive intelligent cooperation and execution of his general orders, relieving him and his patients of annoyance and loss of time. It will thus perform a high humanitarian service. It is, moreover,

a storehouse of data for the investigator to draw on when desired, and there will be few persons interested in diabetic metabolism from any standpoint at all who may not learn something of value from reading it through.

Social Medicine, Medical Economics and Miscellany

Quackery in Switzerland

In 1914, Dr. H. Hunziker of Basel sent out a question blank to several hundred physicians in Switzerland asking for data on the quacks in their vicinity—the numbers, names, former occupations, the diseases they claim to treat in particular, their remedies, whether their clients are natives or tourists, and whether they treat by correspondence. He reports in the *Correspondenz-Blatt für schweizer Aerzte*, Sept. 23, 1916, that most of the blanks were returned, and he comments on the data thus obtained. They show that in the different cantons there are from 0.08 to 6.04 quacks per 10,000 inhabitants. Two of the cantons place practically no restrictions on the practice of medicine, and one has 134.6 quacks to every hundred physicians. In the whole country there are 198 known quacks to 2,500 registered physicians, that is, 7.4 professional quacks to every hundred physicians. The laws in regard to the practice of medicine and advertising and sale of proprietaries differ widely in the different cantons, which renders it particularly difficult to combat evil practices. Important progress was realized in 1900, when a central committee was organized to pass on proprietaries. To date, eleven cantons have joined this organization. The central committee consists of a physician, a pharmacist and a chemist. They are appointed by the public health authorities of the canton of Zurich, and have a laboratory at Zurich where they examine all secret medicines and pharmaceuticals sent in for the purpose by the cantonal boards of health. They are tested for possible injury to health, suitable composition, fraud in advertising in labels and circulars, and selling price as compared with the value. The report on each is distributed to each of the cantonal boards of health and also to the national public health service. Up to April, 1916, they had thus reported on 921 proprietaries. The reports are published in the official weekly bulletin for Switzerland, the *Sanitarisch Demographische Wochenbulletin*. Hunziker calls on the medical societies of the cantons to watch for neglect or lax enforcement of existing regulations on these evils, "unpleasant as the task may be. We must bend our efforts further to have the gaps in the existing laws filled up. From one canton which puts no restraint on these practices, the whole country is flooded with the quacks' circulars. By looking up the past records of the quacks, means can often be found to drive them out of the country. It is the duty of the state to protect its citizens against fraud."

He outlines further a plan for a propaganda, enlightening the public by lectures, press articles, pamphlets, etc. "We must not wait for such opportunities, we must make them. We physicians are the leaders of the people in hygienic questions. It is our duty to enlighten them in the field of care of the health. People long for general information on such matters and they have a right to it, and if we do not supply it the quacks will. The hygiene commission of the Swiss *Gemeinnutzige Gesellschaft* has decided to issue a pamphlet on quacks and the fight against them. In conclusion, Hunziker advocates founding some central office where quacks' advertisements and literature can be collected and used for propaganda purposes, placed at the disposal of physicians. Here should be collected data about quacks, their former lives and records in general. The medical society in each canton should appoint some member who should collect all data on quack practices and examine newspapers, etc. The advertisements of quacks outside the canton should be sent to the central office for further investigation. Some quacks advertise in papers outside their own canton, and nothing is known in their home town of their practices. The board of health of Basel has offered to serve as the central antiquack office. He adds, "A weapon has finally been found against registered physicians who stoop to cooperate with quacks. Nothing is so detrimental to the prestige of the profession as this. The right to practice medicine was recently withdrawn by the Basel court from a physician who was working with a quack, and the court of appeals has confirmed the decision."

Industrial Pensions in Sweden

Regulations for the inauguration of the largest private pension project in the history of Sweden were promulgated, Nov. 19, 1916, at a meeting of the superior board of managers of Swedish industrial associations and various chambers of commerce, according to U. S. Consul B. M. Rasmussen at Göteborg (*Commerce Reports*, Jan. 2, 1917).

Men pay 10 per cent. of their salaries for their own pensions and 6 per cent. for family pension. Men from 21 to 34, women from 18 to 30, and new employees under 47 and 42, respectively, are required to insure themselves. Men are eligible to full pensions at 62, when they are to be paid 60 per cent. of the salary received at the age of 47, no pension being computed on a salary higher than 5,000 crowns ($1,340). Those persons joining the association between 34 and 42 may receive the full pension at 63 and 65, respectively, provided they reached their maximum salaries at 42. Irrespective of the age of joining the association or of receiving the maximum salary, pensioners may receive the full pension by paying premiums required in excess of the fixed maximum dues. All male members, whether married or single, are obliged to contribute to the family pension fund. A family pension is computed at 25 per cent. of the head of the family up to 5,000 crowns. Children surviving both parents are entitled to a pension up to 18. A member when he reaches the pension age, unmarried and active, is to be reimbursed for all sums he has contributed to the family pension fund.

As women live longer than men, their premium is 12 per cent. They are entitled to full pension at 57, provided they reach their highest compensation before 38. Membership is compulsory for all employees of concerns whose owners are members. Employees may be exempted if they already carry life insurance and are unable to pay additional dues.

Primary Sarcoma of Pancreas

In the *Clinical Journal*, Nov. 22, 1916, H. M. Fletcher cites a case of primary round-cell sarcoma of the pancreas with metastases occurring in a boy, aged 17, who was admitted to the hospital with the following history: Four months previously he suffered with pains in his chest and thighs; but he had not been away from military duty on that account. Three weeks prior to admission he was affected with left facial paralysis, which was preceded by a feeling of numbness on that side of the face. A week before admission the pains in the chest and thighs became much worse; the patient was constipated, but there was neither headache nor vomiting. His past history was good; he had suffered from no serious illness. The diagnosis was pleurisy. Fletcher felt that the patient's condition was due to something much more serious than a slight attack of pleurisy coinciding with Bell's palsy. He came to the conclusion, wrongly as it proved, that he was suffering from acute general tuberculosis with tuberculous meningitis. This diagnosis appeared to explain the general symptoms, such as pyrexia, headache and vomiting, and also the facial paralysis. The diagnosis of tuberculous meningitis was apparently confirmed by the examination of the cerebrospinal fluid, and by the blood count associated with an increase of lymphocytes. The postmortem examination proved it to be a case of primary sarcoma of the pancreas. The meningeal symptoms were due to a minute hemorrhagic secondary growth in the dura, involving the bone. There were also secondary growths in the kidneys, parietal bone, orbital plate, dura mater, glands of the neck and axilla.

Medicolegal

What Deemed "Personal Injury" to Employee—Erysipelas After Frostbite

(Larke vs. John Hancock Mut. Life Ins. Co. et al. (Conn.), 97 Atl. R. 320)

The Supreme Court of Errors of Connecticut affirms a judgment sustaining an award under the workmen's compensation act in favor of the claimant whose husband had been in the employ of the company soliciting insurance and collecting insurance premiums. There was a finding that the unusual exposure of the man's employment to the weather caused a frostbite producing lesions of the face, through which the germ of erysipelas entered and that disease developed, from which he died. The Court says that the first question for decision was whether the frostbite was a personal injury "arising in the course of and out of his employment." The conclusion is that it was. The Court thinks that the lesion, whether produced by a frostbite or a blow, must be held to be a personal injury within the workmen's compensation act. In either case the injury would be the result of an untoward mishap. If the term "personal injury" be given its narrowest construction and confined to injuries of accidental origin, it must be held to include any form of bodily harm or incapacity, whether arising by direct contact, or lesion caused by external violence or physical force, or untoward mishap. An attempt to frame an all-embracing definition so as to include all injuries arising in the course of one's employment would probably prove its inadequacy under the changing conditions of time. In a general way, sufficient for this case, and perhaps helpful in the consideration of other cases, the Court may say an injury to an employee is said to arise in the course of his employment when it occurs within the period of his employment, at a place where he may reasonably be, and while he is reasonably fulfilling the duties of his employment, or engaged in doing something incidental to it. An injury which occurs in the course of the employment will ordinarily arise out of the employment, but not necessarily so. The term "arising out of," in this act, points to the origin or cause of the injury. Speaking generally, an injury arises out of an employment when it occurs in the course of the employment and as a proximate result of it. If the primary injury arises out of the employment, every consequence which flows from it likewise arises out of the employment. The chain of causation may not be broken. Every injurious consequence flowing from it is a part of this chain. It was immaterial that erysipelas does not ordinarily result from frostbite; it was enough if in this instance it was caused by it. All physical consequences and disease result from an injury when there is a causal connection between them.

Revocation of License for Conviction of Offense Involving Moral Turpitude

(State Board of Medical Examiners vs. Harrison (Wash.), 159 Pac. R. 769)

The Supreme Court of Washington finds no merit in the appeal of the defendant and affirms a judgment of the superior court affirming an order of the state board of medical examiners, which order revoked the license of the defendant to practice medicine as an osteopath within that state. The Court says that it appeared that a complaint was filed with the board charging that the defendant had been convicted of an offense involving moral turpitude in that she had been indicted and convicted in the United States District Court at Seattle for "knowingly, by means of the United States mail, giving notice and information" to certain persons named "when, how, and by whom and by what means an abortion could and would be done and performed and produced." The statute provides at Section 8397, Rem. & Bal. Code of Washington, that: "Whenever any holder of a certificate herein provided for is guilty of unprofessional conduct, as the same is defined in this chapter, and said unprofessional conduct has been brought to the attention of the board granting said certificate, in the manner hereinafter pointed out . . . it shall be their duty to, and they must, revoke the same at once, and the holder of said certificate shall not be permitted to practice medicine and surgery, or osteopathy, . . . in this state." Section 8397½ provides that: "The words 'unprofessional conduct,' as used in this chapter, are hereby declared to mean: First. The procuring, or aiding or abetting in procuring a criminal abortion. . . . Fifth. Conviction of any offense involving moral turpitude, in which case the record of such conviction shall be conclusive evidence. . . ." The defendant contended that the provision that a conviction of any offense involving moral turpitude shall be conclusive evidence is void unless it shall be construed to mean that the state board of medical examiners or the courts may inquire into the facts and circumstances attending such former conviction for the purpose of ascertaining if the offense for which the person was so convicted is one involving moral turpitude. The defendant contended that this provision is a rule of evidence, and not of what is termed substantive law; and from this it was argued that it is the duty of the Court to hear the evidence and determine as a question of fact, irrespective of the former conviction, whether the accused is really guilty of an offense involving moral turpitude. But whether the statute under consideration is a declaration of substantive law or a rule of evidence, the Court holds is of no importance, for the Court is satisfied that the legislature has no power to declare either a rule of law or a rule of evidence in a case of this kind. The Court is satisfied that the legislature had the power and authority to pass the statute under consideration, and that it was the duty of the state board of medical examiners, when the conviction was admitted, to cancel the defendant's certificate. In such a case as this there is no discretion, either in the board or in the Court, as to the penalty. The statute provides that it shall be the duty of the board to revoke the license to practice medicine in the state. That is the only penalty. It was also argued that the term "moral turpitude," as used in the statute, is so vague and uncertain as to render the law unreasonable and void; but those words are capable of accurate definition, and are well understood, as was determined in re *Hopkins*, 54 Wash. 569, 103, Pac. R. 805.

Death From Accidental Septic Poisoning

(Merrick vs. Travelers' Insurance Co. (Mo.), 189 S. W. R. 392)

The Kansas City (Mo.) Court of Appeals affirms a judgment in favor of the plaintiff, the widow of a practicing dentist who died while insured by the defendant under an accident policy which was stated to cover "septic poisoning, the result of external inoculation through accidental contact with septic matter." The court says that the evidence of the plaintiff disclosed that the insured was apparently in good health, but had been afflicted for two weeks or more with a slight cold and its attendant inflammation of the nasal mucous membrane, though the cold and inflammation had almost disappeared at the time of his alleged infection. He was working in his office on the teeth of a patient who was suffering from a virulent and advanced attack of pyorrhea, when the patient suddenly coughed with explosive violence, ejecting a spray of saliva into the insured's face. The next day the insured and the plaintiff attended a matinee, and on leaving the theater he complained of a headache. After returning home, the pain, which was in the forehead just above the nose, seemed to increase and extended around to the ear. He slept little that night. The next day he dressed, but reclined all day and suffered from the pain, which did not abate. The next morning, which was Monday, he went to the office to keep an appointment, but returned home at 1 o'clock in a taxicab and was suffering intensely from the pain in his forehead and ear. He went to bed and had the family physician called. Constantly but gradually he grew worse and died about three months after he became bedfast. Epidemic spinal meningitis was prevalent in the city, and the insured exhibited many symptoms of that disease, and the attending physician certified that it was the cause of his death. The symptoms of the insured also were similar to those of certain syphilitic attacks. The plaintiff's evidence, however, dealt with every possible cause of diseases mani-

fested by the symptoms of the one in question, and definitely excluded from the sphere of reasonable inference all other causes than that alleged, namely, that virulent germs which were a part of septic matter were accidentally brought into the nasal passage, where by natural processes they thrived, multiplied and found their way to the brain, producing a condition which resulted in the death of the insured. To sustain her burden of proof, the plaintiff was not required to adduce uncontradicted opinion evidence, but only such evidence as would seem reasonable to the common understanding, consistent with itself and its basic facts, and which, if accepted, would exclude any other conclusion than that the alleged cause of the fatal disease was the actual proximate cause. To say that the plaintiff did not sufficiently prove her cause would be to hold, in effect, that no liability based on the stipulation quoted could be proved if the experts of the respective parties disagreed. The court did not err in sending the case to the jury.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Obstetrics and Diseases of Women and Children, York, Pa.

February, LXXIV, No. 2

1 Complement Fixation in Abortions of Women, with Special Reference to B. Abortus (Bang) and B. Abortivo-Equinus. P. F. Williams and J. A. Kolmer, Philadelphia.—p. 193.
2 *Traumatic Separation of Symphysis Pubis. R. M. Beach, Brooklyn.—p. 203.
3 Treatment of Contracted Pelves; Pubiotomy; Report of Cases. A. J. Rongy, New York.—p. 208.
4 Method of Determining Dilatation of External Os During Labor by Means of External Examination. W. E. Welz, Detroit.—p. 221.
5 *Rectal vs. Vaginal Examination in Labor. S. E. Moore, Minneapolis.—p. 225.
6 Complete Rupture of Uterus at Full Term without Hemorrhage or Shock; Recovery of Both Mother and Child. T. E. Neill, Washington, D. C.—p. 235.
7 Interstitial Pregnancy; Report of Case. I. S. Stone, Washington, D. C.—p. 239.
8 Malignant Leiomyomas of Uterus. F. Warner, Columbus—p. 241.
9 *Case of Hemangioendotheliblastoma in Pregnancy. S. Graves and J. W. Price, Jr., Louisville, Ky.—p. 250.
10 Diverticulitis of Descending and Pelvic Colon. J. W. Keefe, Providence, R. I.—p. 252.
11 Technic of Abdominal Hysterectomy. J. F. Baldwin, Columbus.—p. 263.
12 *Inguinal Hernia Attached to Cord, Undescended Testicle, Uterus, Tubes and Broad Ligaments. E. D. Clark, Indianapolis.—p. 273.
13 Absence of Muscular Tone an Important Etiologic Factor in Postoperative Ileus. R. R. Huggins, Pittsburgh.—p. 278.
14 Chronic Intestinal Stasis; Case Reports. W. S. Bainbridge, New York.—p. 284.

2. **Traumatic Separation of Symphysis Pubis.**—The obstetric history of Beach's patient was interesting. The first labor was dry and instrumental and was followed by three normal deliveries. The fifth was dry and instrumental causing a third degree laceration, which was repaired three months later. The sixth and seventh labors were normal but the eighth was a forty-eight hour labor which was terminated by forceps. Following this delivery the patient was in bed for sixteen days, suffered extreme sacral pain on motion and was unable to walk for three months after the delivery. This labor was two and one-half years before the ninth or present one. After the patient eventually became able to walk, she remained in fair health except for some backache after a hard day's work, or on rotary motion of the thighs. During the last pregnancy, before coming to the hospital, she had no unusual symptoms and considered herself normal. Admission examination showed a 40 cm. fundus with a normal left occipito-anterior position, head at the brim. Vaginal examination showed that the ends of the pubic bones were so widely separated that four fingers could be placed in the interval. Labor progressed normally terminating at the end of thirteen hours in the spontaneous birth of a 9¼ pound baby. Following the delivery the ends of the pubic bones came together to within about 3 cm. of each other. The puerperium was absolutely uneventful. She was up on the thirteenth day, was soon walking without the least discomfort, and went home on the eighteenth day.

5. **Rectal vs. Vaginal Examination in Labor.**—Rectal examination alone, or when combined merely with abdominal palpation in pregnancy and labor, as a substitute for vaginal examination in parturition, in Moore's opinion, is not compatible with an intelligent management of childbirth. But the rectal route with abdominal palpation in pregnancy and parturition, and the vaginal examination in pregnancy, subject to the rule, "When in doubt . . . resort to the vaginal route," can be used in the majority of labors without necessitating any vaginal examination during labor. Keep out of the vagina in labor except when necessary to do otherwise. The author recommends primary vaginal examination in all cases first seen in labor and in all cases of delayed labor, and of course in cases in which operative interferences has been indicated, and to use the rectal route as an adjunct to a primary vaginal examination, thus avoiding numerous vaginal examinations, which should always be condemned. The vaginal examination should be made before rupture of the membranes, the cervix being dilated, as diagnosed per rectum, and get the benefit of the autogenetic douche of liquor amnii. Rectal examination and abdominal palpation in pregnancy and labor should be more thoroughly taught in medical schools.

9. **Hemangioendotheliblastoma in Pregnancy.**—This is a report of a tumor of the upper jaw which repeatedly grew larger during gestation, became smaller after parturition and recurred after removal.

12. Abstracted in THE JOURNAL, Oct. 28, 1916, p. 1325.

American Journal of Physiology, Baltimore

January, XLII, No. 2

15 *Studies in Experimental Glycosuria. Retention of Dextrose by Liver and Muscles and Influence of Acids and Alkalies on Dextrose Concentration of Blood. J. J. R. Macleod and M. E. Fulk, Cleveland.—p. 193.
16 Response of Vasomotor Mechanism to Different Rates of Stimuli. C. M. Gruber, Philadelphia.—p. 214.
17 Effect of Temperature Changes on Rhythm in Human Electromyogram. A. Forbes and W. C. Rappleye, Boston.—p. 228.
18 *Bile Pigment Metabolism. Bile Pigment Output and Blood Feeding. G. H. Whipple and C. W. Hooper, San Francisco.—p. 256.
19 *Id. Influence of Fresh Bile Feeding on Whole Bile and Bile Pigment Secretion. C. W. Hooper and G. H. Whipple, San Francisco.—p. 264.
20 *Id. Influence of Bile Constituents on Bile Pigment Secretion, Taurocholic, Glycocholic and Cholic Acids and Bile Fat. C. W. Hooper, San Francisco.—p. 280.
21 Effects of Partial and Complete Occlusion of Blood Vessels on General Blood Pressure in Man. B. L. Elliott, Washington, D. C.—p. 290.
22 Effect of Rotation and of Unilateral Removal of Otic Labyrinth on Equilibrium and Ocular Reactions in Kittens. A. L. Prince, Boston.—p. 308.
23 Studies on Bioluminescence. Chemistry of Light Production in Japanese Ostracod Crustacean, Cypridina Hilgendorfii, Muller. E. N. Harvey, Washington, D. C.—p. 318.
24 Id. Chemistry of Light Production by Fire-Fly. E. N. Harvey, Washington, D. C.—p. 342.
25 Id. Light Production by Japanese Pennatulid, Cavernularia Haberi. E. N. Harvey, Washington, D. C.—p. 349.

15. **Dextrose Retention.**—When dextrose is injected by way of the portal vein into anesthetized dogs in amounts which are below the tolerance limit (about 0.8 gm. per kilogram an hour), there occurs a rapid increase in the percentage of blood sugar. This rise continues until a certain level is attained, after which the blood sugar remains practically constant. The time at which the constant level is attained varies with the rate of injection. When the behavior of the sugar concentration is compared in blood drawn from the portal vein, vena cava and iliac veins during moderate dextrose injections, it has usually been found that there is very little difference. During the injection of large amounts of dextrose the H-ion concentration of the blood, as determined by the colorimetric method, very commonly becomes increased. When alkali (sodium carbonate) is injected intravenously in sufficient amount to lower the H-ion concentration of the blood, in animals in which the blood sugar per-

centage is initially high (etherization and operative manipulation in sugar fed dogs), there is a very distinct decrease in blood sugar, but by comparison of the curves which represent this in the portal vein, vena cava and iliac vein, it cannot be shown whether the liver or the muscles are primarily responsible for the increased retention.

The injection of sodium carbonate solution or of hydrochloric acid at intervals into the portal vein during the continuous injection into another branch of the same vein of a dextrose solution does not disturb the relationship in sugar concentration normally existing in blood taken from portal vein, vena cava and iliac vein, nor do such injections cause any alteration in the level of the curves, whether these be rising or stationary. When dextrose is injected at a rate below the tolerance limit, along with sufficient alkali to cause a distinct increase in p_H of the blood of the portal vein and vena cava, the blood sugar does not rise to such a degree as it does when the dextrose solution is neutral or acid in reaction.

18. **Bile Pigment Output and Blood Feeding.**—The flow of bile and the secretion of bile pigments in the dog are not influenced by the ingestion of fresh blood, freshly laked red cells, cooked or digested blood.

19. **Effect of Feeding Bile on Bile Secretion.**—Feeding fresh bile to bile fistula dogs causes an almost constant cholagogue action, with a fall in the output of bile pigments. These experiments exclude the possibility of bile pigment absorption from the intestine.

20. **Effect of Feeding Bile Constituents.**—Taurocholic acid given by the mouth has a strong cholagogue action, but little influence on the secretion of bile pigments in bile fistula dogs. Glycocholic acid has a moderate cholagogue action but a strong inhibiting effect on bile pigment secretion. Cholic acid has little if any cholagogue action, but may decrease somewhat the bile pigment secretion in the bile fistula dog. Bile fat (ether extract) has no cholagogue action, but has a strong inhibiting effect on the secretion of bile pigments.

Annals of Surgery, Philadelphia

January, LXV, No. 1

26 Fractures of Lower Extremity or Base of Radius. L. S. Pilcher, Brooklyn.—p. 1.
27 *Volkman's Ischemic Myositis and Contracture. A. S. Taylor, New York.—p. 28.
28 Gunshot Injuries of Peripheral Nerves and Their Treatment; Report of Cases. H. Fischer, New York.—p. 56.
29 *Carcinoma of Breast. J. C. Oliver, Cincinnati.—p. 66.
30 *Autogenous Fascial Reconstruction of Bile Duct; Report of Case. N. Ginsburg and J. Speese, Philadelphia.—p. 79.
31 Splenectomy for Repeated Gastro-Intestinal Hemorrhages. D. C. Balfour, Rochester, Minn.—p. 89.
32 Enterostomy for Ileus; Report of Cases. C. N. Dowd, New York.—p. 95.
33 *Temporary Colostomy. H. A. Shaw and J. Hunt, Seattle.—p. 105.
34 Case of Fibroma of Small Intestine Resulting in Intussusception. J. E. James, Jr., and S. W. Sappington, Philadelphia.—p. 109.
35 Case of Gunshot Wound of Carotid Artery. E. G. Alexander, Philadelphia.—p. 115.
36 Case of Stab Wound into Right Auricle of Heart. C. F. Nassau, Philadelphia.—p. 119.
37 Case of Stab Wound into Left Ventricle of Heart. J. F. Jones, Philadelphia.—p. 120.
38 Cases of Infectious Arthritis. W. J. Merrill, Philadelphia.—p. 123.
39 Acidosis in Surgical Conditions. J. H. Austin, Philadelphia.—p. 126.

27. **Ischemic Myositis.**—The value of the elastic traction method of overcoming the cicatricial contracture in these cases is endorsed by Taylor. A brace is made on a plaster-of-Paris model of the forearm so as to fit smoothly. It is applied without lacing it so tightly as to interfere with the circulation. Elastic finger traction is applied up to the point of moderate discomfort. The apparatus is left on continuously except for two intervals of an hour each, morning and afternoon. During these periods, the whole extremity is immersed in hot water for twenty minutes, kept as hot as bearable by constant addition of hot water. If nerve involvement is present the heat must be less and the attendant's hand should be used as a guide. After the immersion, massage and vigorous passive motion is used, and, finally, attempts at voluntary motion encouraged. When the contractured tissues have been well stretched, so as to permit a good degree of passive extension of fingers and wrist simultaneously, the apparatus is left off during the day so as to encourage active motion and use, and then worn during sleep to avoid recurrence of the contracture. As the tendency to recurrence disappears the apparatus is used less and less until it is finally discarded. The child is systematically trained to use and develop all the muscles which have survived.

29. **Carcinoma of Breast.**—An analysis of 100 consecutive cases of carcinoma of the breast was made by Oliver. Four patients were under 3 years of age and 14 were under 40; 17 patients were over 60; 67 patients were between 40 and 60 years of age. In 56 patients the disease was in the right breast; in 43 in the left breast. The actual number of cases which have survived the three-year period, is 41. The known dead are 65, and in 4 the result is unobtainable. Of those living, 1 is alive twenty-one years after operation; 3, fourteen years; 3, fifteen years; 1, thirteen years; 1, twelve years; 1, ten years; 3, eight years; 5, seven years; 3, six years; 3, five years; 3, four and a half years; 3, four years; 5, three and a half years; 1, three and a quarter years; 2, three years. Twenty-two of the successful patients knew of the existence of the disease for nine months, or less, previous to operation, while 12 gave a history extending over from one to twelve years. The recurrences after operation exhibit a wide range. In 14 cases the metastases were internal; 7 had secondary deposits in the spine; 2 in the mediastinum; 1 in the brain; 1 in the skull; 1 in the lower jaw and one in the sternum and supraclavicular fossa. Nine cases had purely local recurrences, and 8 had local and internal recurrences. The other breast was secondarily involved in one patient. Oliver recommends systematic postoperative Roentgen-ray treatment.

30. **Reconstruction of Bile Duct.**—In the case cited by Ginsburg and Speese during the performance of a cholecystectomy the common duct to which the cystic duct was parallel, was caught in the forceps applied to the cystic duct, and both structures were divided. Satisfactory healing of the incision took place, except for the establishment of a biliary fistula. The patient made a good operative recovery. At a second operation it was found that division of this structure had taken place half a centimeter below the junction of the right and left hepatic ducts, with some loss in continuity of the duct wall. Since apposition of the two ends of the bile duct was impossible, a T-shaped rubber tube was inserted into the proximal and distal ends of the bile duct and fixed by catgut sutures. About 2 inches of the duct needed reconstruction, and this was accomplished by enveloping the rubber tube with a section of posterior rectus sheath fascia, including the peritoneum, taken from the region of the wound. The fascial surface of the transplant was placed in contact with the rubber tube, and both ends were carefully sutured to and around the proximal and distal ends of the bile duct, and also to the wall of the duodenum. After a week the distal end of the T-tube broke away at the junction of the fascial transplant with the distal end of the common duct, and was impinging on the wall of the duodenum, as was determined at a third operation. A small thick-walled rubber tube, slightly less in diameter than that of the common duct itself, was substituted for the T-tube, and the bile duct reconstructed around this tube, carefully suturing the transplant to the distal portion of the bile duct as well as to the wall of the duodenum. Four months since the successful reconstruction of the duct was accomplished, the rubber tube has not been passed, and the patient has not suffered from any symptoms suggestive of biliary colic.

33. **Temporary Colostomy.**—The technic devised by Shaw and Hunt is as follows: Incision, exploration, etc., are just the same as in any type. Choice of dealing with the gut, that is, single barrelled, double barrelled or simple attachment of the gut to the peritoneum, is simply a matter of judgment; after such decision, grasp the gut with a crushing clamp. Within the bite of the crushing forceps is interposed a piece of dentist's rubber dam, the same width as the proposed stoma and about 4 inches long. The parietal peritoneum is carefully circumstitched around the gut. Next apply another crushing forceps parallel and distal to the first, then cut

between, cauterize with phenol and apply a Kerr basting stitch, the ends of which are brought out through the abdominal wall and tied over gauze. This stitch is to be removed when necessity calls for a patent stoma. At the end of thirty-six hours, union between the parietal and visceral peritoneum is complete and the basting stitch may be cut close to the skin on one end and pulled out at the other. The rubber acts as a guide to the stoma, which sometimes remains sealed after the stitch is removed, due to the crushing of the forceps; the introduction of the gloved finger easily overcomes this. The subsequent treatment would be that following any type of colostomy, depending on the individual case.

Archives of Ophthalmology, New Rochelle, N. Y.

January, XLVI, No. 1

40 Present Status of Sclerocorneal Trephine Operation for Relief of Glaucoma. W. R. Parker, Detroit.—p. 1.
41 Ocular Anaphylaxis. Anaphylactic Theory of Sympathetic Ophthalmia. A. C. Woods, Philadelphia.—p. 8.
42 Present Status of Operation for Extraction of Cataract in the Capsule. A. Knapp, New York.—p. 27.
43 Three Cases of Unusual Vitreous Opacities. H. H. Stark, El Paso, Texas.—p. 38.
44 Traumatic Transplantation of Cilia into Anterior Chamber. H. L. Begle, Detroit.—p. 47.
45 Is After Cataract More Frequent After Operations for Immature Cataract? T. Heyl, Munich.—p. 53.
46 Keratectomy. C. Foroni, Genoa.—p. 57.

Arkansas Medical Society Journal, Little Rock

January, XIII, No. 8

47 Plastic Surgery of Nose and Eyelids; Report of Cases. L. H. Lanier, Texarkana.—p. 155.
48 Apparatus for Transfusion of Blood by Sodium Citrate Method. N. Mumey, Little Rock.—p. 158.
49 Nephrolithiasis. J. P. Runyan, Little Rock.—p. 161.
50 Eclampsia. J. W. Melton, Slocum.—p. 163.

Boston Medical and Surgical Journal

January 25, CLXXVI, No. 4

51 Group of Injuries in Modern Warfare. J. W. Churchman, New Haven, Conn.—p. 113.
52 Jejunal Ulcer; Two Cases Treated by Resection and End-To-End Anastomosis of Jejunum. E. P. Richardson, Boston.—p. 118.
53 Vaginal Delivery After Cesarean Section; Report of Cases. N. R. Mason, Boston.—p. 127.
54 Reasons for Reentry of Hospital Patients. E. B. Young, Boston. —p. 133.

Canadian Medical Association Journal, Toronto

January, VII, No. 1

55 *Pyloric Stenosis in Infants. W. E. Gallie and L. B. Robertson, Toronto.—p. 1.
56 Tuberculosis Often of Secondary Importance to Other Pathologic Conditions. C. D. Parfitt, Gravenhurst.—p. 10.
57 Blood Transfusion. C. K. P. Henry, Montreal.—p. 18.
58 Treatment and Management of Congenital Syphilis. G. E. Smith, Toronto.—p. 27.
59 Modern Treatment of Syphilis. L. W. Harrison.—p. 31.
60 Antituberculosis Work in Small City. F. C. Neal, Peterborough. —p. 44.
61 Fallacies in Localization of Foreign Bodies by Roentgen Ray. W. H. Eagar, Halifax, N. S.—p. 51.

55. **Pyloric Stenosis in Infants.**—During the past two years sixteen cases of undoubted pyloric stenosis have been treated surgically in the hospital for sick children in Toronto. Of these sixteen cases, eleven recovered, a mortality of 31.2 per cent. Of the five infants who died, one died of hemorrhage; one died sixty hours after operation with no relief of the symptoms because of incomplete operation; a third patient who died three days after operation was a very desperate case on admission, there having been absolute constipation for five days and vomiting of all the food. This patient ceased vomiting after the operation but had evidently passed the possibility of recovery before operation; the fourth case was a prostrated, premature baby which had practically no chance from the beginning. It died about twelve hours after operation. Necropsy showed hypostatic congestion of the lungs, nephritis and colitis. The fifth died three days after operation, in spite of the relief of vomiting, of general weakness. Of the eleven patients who recovered, two died subsequently, of other conditions. The first died six weeks after the operation of acute enterocolitis. All the symptoms of pyloric stenosis were relieved by the operation and the case was a favorable one for complete recovery until the intestinal infection developed. The second patient died of pneumonia and empyema about a year after the operation. The relief of the pyloric obstruction had been complete and recovery perfect. At 14 months of age he appeared to be a normal baby. At necropsy the pyloric enlargement was found to persist although the ratio of its size to that of the neighboring intestine was slightly smaller. The remaining nine patients are alive and well, apparently suffering no ill effect from their pathologic condition or from the operation.

Indiana State Medical Association Journal, Fort Wayne

January, X, No. 1

62 Workmen's Compensation Law in Its Relation to Practice of Medicine. H. S. Landers, Indianapolis.—p. 1.
63 *Diagnosis in Certain Gastric Disorders. H. Miller, South Bend. —p. 10.
64 *Necessity of Coordinating Methods in Definite Diagnosis of Pulmonary Tubercular Lesions. F. B. Wynn, Indianapolis.—p. 15.
65 *Roentgen Ray Diagnosis in Pulmonary Tuberculosis. R. C. Beeler, Indianapolis.—p. 18.

63, 64 and 65. Abstracted in THE JOURNAL, Oct. 28, 1916, p. 1327.

Journal of Bacteriology, Baltimore

January, II, No. 1

66 Colorimetric Determination of Hydrogen-Ion Concentration and Its Applications in Bacteriology. W. M. Clark and H. A. Lubs, Washington, D. C.—p. 1. To be continued.
67 Soil Flora Studies. H. J. Conn, Geneva, N. Y.—p. 35. To be continued.
68 *Influence of Milk and Carbohydrate Feeding on Character of Intestinal Flora. Diet vs. Bacterial Implantation. T. G. Hull and L. F. Rettger, New Haven, Conn.—p. 47.
69 Coccidia in Subepithelial Infections of Intestines of Birds. P. B. Hadley, Providence, R. I.—p. 73.
70 Bacterial Disease of Wragg Cherry. W. G. Sackett, Fort Collins, Colo.—p. 79.

68. **Influence of Milk on Intestinal Flora.**—The most important factor in determining the character of the intestinal flora according to Hull and Rettger is the diet. Lactose, milk and mixed grains (wheat, oats, etc.) are specific articles of diet which exert such an influence. Lactose, when fed in sufficient quantities (2 to 3 gm. daily), brings about a complete transformation of the flora of white rats within two to three days; milk requires a longer time, and does not bring about a complete change. Milk and lactose together form the most practical and effective diet, at least for man. Grain feeds tend to increase the number of aciduric bacteria, but their influence is comparatively small. Milk undoubtedly owes its beneficial action to the lactose which constitutes almost half of the solid matter present. The explanation of this action must lie in the fact that the lactose is absorbed slowly from the intestine. On several occasions it was found by the authors in the feces of rats that had been supplied with it as a part of their diet. The raw grains are also probably acted on slowly, or at least some of the intermediate carbohydrate products are not immediately absorbed. Bread, on the other hand, which contains cooked starch does not foster the development of the aciduric bacteria, because it is digested quickly, and no available sugar remains in the intestine long enough to be attacked and utilized by this group of bacteria.

Meat or other high protein diet increases the indol-producing bacteria and other organisms of the so-called "putrefactive" type; cornstarch appears to foster the amylolytic group of intestinal organisms, while in a few experiments grain feed seemed to favor the development of what appeared to be fusiform bacilli. The reaction of the intestine remained independent of the character of the intestinal flora. The acidity was highest in the duodenum, as a rule, and lowest at the ileocecal valve.

Journal of Cutaneous Diseases, Boston

January, XXXV, No. 1

71 *Rare Form of Scleroderma. A. Ravogli, Cincinnati.—p. 1.
72 Follicular Type of Eczema Seborrheicum. W. B. Trimble, New York.—p. 11.
73 Fissure of Lip; Device for Its Treatment. W. A. Pusey, Chicago. —p. 16.
74 *Elephantiasis Nostras; Report of Case. J. A. Elliott, Ann Arbor, Mich.—p. 17.
75 Case of Epidermolysis Bullosa, Showing Loss of Elastic Tissue in Apparently Normal Skin. R. S. Weiss, St. Louis.—p. 26.
76 Histopathology. W. J. Heimann, New York.—p. 28.

71. **Rare Form of Scleroderma.**—The scleroderma in Ravogli's case he says, was probably due to peripheral neuritis. The system was affected by a form of diathesis, which had disturbed the equilibrium of the internal secretions, a sudden change of temperature due to exposure to wet and cold acted as a determining cause.

74. **Elephantiasis Nostras.**—A large majority of the cases of elephantiasis nostras, Elliott says, are due to the streptococcus of Fehleissen. The primary changes are in the blood vessels rather than in the lymphatics. The secondary changes are lymph stasis, edema, a marked hypertrophy of collagen with an infiltrate of small round cells and some polynuclear leukocytes. Leprosy and acute scleroderma are to be considered in the differential diagnosis. The streptococcic origin of the disease suggests that the local measures might well be augmented by antistreptococcic serum in the treatment of the disease.

Journal of Laboratory and Clinical Medicine, St. Louis

January, 11, No. 4

77 *Application of Typhoidin Test in Group of Nurses and Physicians. F. P. Gay and A. R. Lamb, San Francisco.—p. 217.
78 Cardiac Aneurysms; Report of Cases. P. G. Woolley, Cincinnati. —p. 221.
79 *Occurrence of Immature Polynuclear Leukocytes in Circulating Blood in Pulmonary Tuberculosis and Other Infectious Diseases. A. M. Burgess, Providence, R. I.—p. 240.
80 *Simple Method of Plotting Charts. J. R. Williams, Rochester, N. Y.—p. 247.
81 Macrophages in Feces in Acute Dysentery. K. M. Lynch, Charleston, S. C.—p. 251.
82 Pathologic Effects of Atmospheres Rich in Oxygen. H. T. Karsner, Cleveland and J. E. Ash, U. S. Army.—p. 254.
83 *Blood Pressure in Aged. L. M. Bowes, Chicago.—p. 256.
84 Demonstration of Treponema Pallidum in Cerebral Cortex of Congenital Syphilitic Child. C. E. Kiely, Cincinnati.—p. 260.
85 Machine for Shaking Blood Mixing Pipettes. G. G. Little, Rochester, Minn.—p. 264.
86 Modification of Noguchi Test. N. E. Williamson, Stockton, Calif.—p. 266.
87 Id. N. E. Williamson, Stockton, Calif.—p. 268.

77. **Application of Typhoidin Test.**—A survey of the percentage of positive results obtained by Gay and Lamb in a study of 154 individuals shows that 75 per cent. of those individuals that had recovered from typhoid (twelve) gave a positive reaction. The negative reactions bear no relation to the date of the antecedent disease, since two cases twenty-two years previously were both positive. From 75 to 40 per cent. of those that had been vaccinated against typhoid (121) also reacted positively and in general in decreasing correspondence with the lapse of time since immunization. Of twenty-one presumably normal individuals, three, 14.28 per cent., gave a positive typhoidin reaction. Whatever may be the eventual understanding of a positive typhoidin test, the authors point out that use of its absence as an indication for revaccination certainly errs on the side of safety in detecting those individuals who in spite of typhoid vaccination do not show indications of a reaction to the typhoid bacillus, and who are, therefore, presumptively those particular individuals who under ordinary conditions of infection will be found to be the least protected ones.

79. **Immature Polynuclear Leukocytes.**—The presence of a high percentage of immature polynuclear leukocytes in the circulating blood (Arneth's "shift to the left"), Burgess states, is evidence of excessive loss of polynuclear leukocytes from the blood stream, and an attempt on the part of the bone marrow to make good the loss. It does not indicate toxemia, nor is it an index of the patient's resistance to infection. Leukocytosis, on the other hand, is evidence of toxemia and of direct stimulation of the bone marrow by certain toxins. A moderate leukocytosis may exist without causing an appreciable change in the Arneth picture. In pulmonary tuberculosis the demand for leukocytes indicated by a "shift to the left" means necrosis and extension of the lesion. In early stages of the disease this may be of considerable value in immediate prognosis, and even, at times, in diagnosis. In advanced disease which is slowly progressing, as the demand for leukocytes apparently varies from time to time, the count appears to be useless in estimating the prognosis. In rapidly progressing tuberculosis the unmistakable clinical evidence of activity renders the study of the blood picture superfluous. In nontuberculous disease the evidence of excessive mobilization of leukocytes may be of value in doubtful cases to determine the presence of large collections of pus.

80. **Simple Method of Plotting Charts.**—The salient features of the method described by Williams are: The printing on standard sheets of cross section paper all the fixed words and characters which will be common to all charts. This usually can best be done by having them first drafted, and zinc etchings and plates or electros made therefrom. The printing on gummed paper of all the common words and characters which the plotting of a given set of data will require. These to be of the proper size and spacing to fit in the chart so as to give uniformity. The printing of several types of cross hatching on gummed stock so that it may be similarly used. The use of a photographic trimming board to smoothly and correctly cut the words, characters and hatching used and the attachment thereto of a scale to facilitate calculations and to minimize errors.

83. **Blood Pressure in Aged.**—There were 100 women and fifty men examined by Bowes in this series. The systolic and pulse pressures increased to the age of 85 and then decreased. The diastolic pressure did not vary much after the age of 70. The blood pressure was higher in women except after the age of 90. There were a few who had very high blood pressures without symptoms. They were going about their everyday duties in apparently perfect health. There were some who simply complained of morning headache, slight vertigo, numbness or tingling of the hands and feet. A third group presented the more severe symptoms of nephritis, aortic regurgitation, cerebral hemorrhage and arteriosclerosis. There were twenty-two who had systolic pressures of 200 mm. of mercury or over. Thirteen had arteriosclerosis alone, three had cardiac lesions, two had nephritis, two had cerebral hemorrhage and cardiac lesions, one cerebral hemorrhage, and one nephritis and a cardiac lesion. The highest systolic pressure was 270 mm. of mercury. This was a case of nephritis. There were twenty-eight who gave diastolic pressures of 100 or over. Sixteen had arteriosclerosis alone. Seven had cardiac lesions, two had cerebral hemorrhage and a cardiac lesion, two cardiac lesions and nephritis, and one had cerebral hemorrhage. There were thirty who had pulse pressures of 100 or over. The highest pulse pressure was 150, observed in a case of aortic regurgitation. Sixteen had cardiac lesions, seven arteriosclerosis alone, three cerebral hemorrhage, three nephritis and one had nephritis and a cardiac lesion. All cases of nephritis had very high blood pressures. The systolic, diastolic and pulse pressures were high in all cases of cerebral hemorrhages. A low pulse pressure was associated with myocarditis or a failing heart; and a sustained pulse pressure of 100 or over usually resulted in myocarditis or a failing heart. In most cases of bronchitis there was a failing heart with lowering blood pressure. Obesity did not seem to influence the blood pressure.

Medical Record, New York

January 27, XCI, No. 4

88 Paratyphoid as Observed During Epidemic in 14th N. Y. Infantry While on U. S. Service at Mexican Border, 1916. C. W. Berry, Brooklyn.—p. 135.
89 Study in Mental Retardation in Relation to Etiology. B. T. Baldwin, Swarthmore, Pa.—p. 141.
90 *Modified Method in Tuberculin Therapy. W. Meyer, West Hoboken, N. J.—p. 147.
91 Multiple Sclerosis Due to Repeated Inhalation of Carbon Monoxid in Furnace Gas; Report of Two Cases. W. J. McGurn, Boston. —p. 149.
92 Reflex Cough. A. B. Bennett, Jr., Washington, D. C.—p. 151.
93 Scorbutus in Ten Months' Old Baby Treated by Transfusions of Citrated Maternal Blood. G. A. Rueck, New York.—p. 152.
94 Most Efficient Anaphrodisiac (Magnesium Sulphate). W. J. Robinson, New York.—p. 153.

90. **Modified Method in Tuberculin Therapy.**—The method described by Meyer consists of the simultaneous administration of three different tuberculins, namely, Koch's old tuberculin (T. O.), Koch's bacillary emulsion (B. E.) and Denys' bouillon filtrate (B. F.).

Pennsylvania Medical Journal, Athens

January, XX, No. 4

95 Support of Stomach After Beyea Gastropexy. Report of Cases. T. T. Thomas, Philadelphia.—p. 241.
96 *Hospital Organization in Rural Pennsylvania. H. L. Foss, Danville.—p. 247.
97 *Clinical Interpretation of Wassermann Test. J. A. Lichty, Pittsburgh and J. H. Whitcraft, Wilksburg.—p. 252.
98 *Modern Diagnosis and Results Clinically, Serologically and Sociologically of Syphilis. B. A. Thomas, Philadelphia.—p. 254.
99 *Treatment of Syphilis by Salvarsan Controlled by Wassermann Reaction. J. D. Wilson, Scranton.—p. 266.
100 Cerebellar Abscess; Symptoms and Differential Diagnosis. P. D. Kerrison, New York.—p. 271.
101 Infective Sinus Thrombosis. R. Butler, Philadelphia.—p. 277.
102 Temporosphenoidal Abscess. G. W. Mackenzie, Philadelphia.—p. 279.
103 Some Tendencies of Workmen's Compensation Law. G. W. Wagoner, Johnstown.—p. 289.

96. Abstracted in THE JOURNAL, Nov. 4, 1916, p. 1395.

97, 98 and 99. Abstracted in THE JOURNAL, Oct. 14, 1916, p. 1181.

Southern Medical Journal, Birmingham, Ala.

January, X, No. 1

104 *Cui Bono; Physician and His Ideals. M. L. Graves, Galveston, Texas.—p. 1.
105 Physician's Work for Naval Preparedness. C. T. Grayson, Washington, D. C.—p. 6.
106 Utilization of Dispensary in Medical Teaching. W. S. Elkin, Atlanta, Ga.—p. 12.
107 Classification and Relations of Cardiovascular Renal Disease. L. F. Barker, Baltimore.—p. 22.
108 Syphilis and Baby. L. R. DeBuys, New Orleans.—p. 29.
109 Infectiousness of Tuberculosis. T. D. Coleman, Augusta, Ga.—p. 33.
110 Uniform Laws for Southern States. O. Dowling, Shreveport, La.—p. 40.
111 Statistical Study of Intestinal Helminthiasis. D. G. Willets, Washington.—p. 42.
112 School Inspection by County Health Officer and How to Secure Correction of Defects. D. E. Sevier, Asheville, N. C.—p. 49.
113 Excision of Upper Jaw. J. W. Price, Jr., Louisville, Ky.—p. 55.
114 *Extraperitoneal Cesarean Section. W. Kohlmann, New Orleans.—p. 58.
115 New Device for Reestablishing and Maintaining Suspended Respiration. J. H. Pierpont, Pensacola, Fla.—p. 61.
116 More Radical vs. Conservative Operation on Pelvic Organs. C. N. Cowden, Nashville, Tenn.—p. 63.
117 Plaster-of-Paris Technic in Fractures. R. W. Knox, Houston, Texas.—p. 69.
118 Thrombosis of Lateral Sinus; Report of Case of Spontaneous Rupture. A. C. Lewis, Memphis, Tenn.—p. 72.

104 and 114. Abstracted in THE JOURNAL, Dec. 23, 1916, p. 1967.

Tennessee State Medical Association Journal, Nashville

January, IX, No. 9

119 Subconjunctival Injections of Mercury Cyanid in Ocular Therapy. E. L. Jones, Cumberland, Md.—p. 345.
120 Occurrence of Malignancy in Gastro-Intestinal Tract. H. T. Brooks, Memphis.—p. 354.
121 Gonorrhea in Woman. J. E. Hall, Nashville.—p. 358.
122 Hysteria of Alleged Traumatic Type. S. R. Miller, Knoxville.—p. 363.
123 Hygiene of Eye. E. Orr, Nashville.—p. 366.
124 Surgery of Gall Passages. C. N. Cowden, Nashville.—p. 368.
125 Rectal Feeding. G. M. Niles, Atlanta, Ga.—p. 374.

Texas State Journal of Medicine, Fort Worth

January, XII, No. 9

126 *What Has Become of High Blood Pressure Cases. R. W. Baird, Dallas.—p. 349.
127 Fumigation of Ships. R. L. Wilson, Galveston.—p. 351.
128 Rewards of Obscure Physician. M. M. Carrick, Dallas.—p. 353.
129 Defects of Sight and Hearing that Retard Mental Development. E. H. Cary, Dallas.—p. 356.
130 Is Diagnosis and Conservative Treatment of Fractures About to Become A Lost Art? B. Saunders, Fort Worth.—p. 358.
131 Physician's Duties and His Relation to Community. J. B. McKnight, Carlsbad.—p. 361.
132 Publicity in Public Health Work. W. F. Thomson, Beaumont.—p. 363.

126. What has Become of High Blood Pressure Cases.—The record of 125 patients with systolic blood pressure 160 mm. and over is analyzed by Baird. Fourteen patients with nephritis, 33 with cardiovascular disease and 28 with cardiac disease are living. Fifty are dead. The causes of death were nephritis, 15; cardiovascular disease, 3; cardiac disease, 18; apoplexy, 8, and undetermined 6. Of those dead, 36 per cent. died during less than one year of observation, and in the next two years 22 per cent. of them died, and all but a very small per cent. die within five years. Patients dying from cardiac dilatation showed a maximum blood pressure of 260 with an average of 190. In the Bright's cases the average was 215, systolic.

United States Naval Medical Bulletin, Washington, D. C.

January, XI, No. 1

133 Prevention of Venereal Diseases at Naval Training Station, Norfolk, Va. C. E. Riggs.—p. 1.
134 Complement Fixation Reaction on Board Ship. W. W. Cress.—p. 15.
135 Syphilis Record. G. F. Cottle.—p. 21.
136 Marines Wounded During Drive on Santiago, Santo Domingo. H. F. Strine.—p. 29.
137 Strychnin-Stovain Spinal Anesthesia. E. P. Huff.—p. 34.
138 Diseases Incident to Submarine Duty. R. W. McDowell.—p. 44.
139 Uncinariasis in Cuba. R. Spear.—p. 50.
140 Ear Disease in Service. G. B. Trible.—p. 53.
141 Treatment of Gastric Ulcer. W. A. Brams.—p. 58.
142 Slop Chute and Garbage Bin for Battleships. W. H. Bell.—p. 67.
143 Preliminary Report on Pathology of Narcotic Addiction. C. F. Stokes.—p. 64.

Wisconsin Medical Journal, Milwaukee

January, XV, No. 8

144 Recent Advances in Study of Heart Disease and Their Significance to General Practitioner of Medicine. F. W. Peabody, Boston.—p. 255.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

January 6, I, No. 2923

1 Early Diagnosis and Treatment of Syphilis. J. H. Sequeira.—p. 1.
2 Diseases of Male Urethra. F. S. Kidd.—p. 3.
3 *Disappearance of Malignant Tertian Crescents from Blood Following Intravenous Injection of Tartar Emetic. L. Rogers.—p. 6.
4 Roentgen Ray Diagnosis of Gas in Tissues. J. D. Morgan and G. Vilvandré.—p. 8.
5 Detection of Gas in Tissues by Roentgen Rays. H. Black.—p. 9.
6 *Keeping Qualities of Therapeutic Serums. A. T. MacConkey.—p. 10.
7 Chemical Factors Involved in Growth of Meningococcus. D. J. Lloyd.—p. 811.
8 Morphin-Hyoscin Method of Painless Childbirth. A. F. Martin.—p. 12.
9 Monomorphic Trypanosome Found in Blood of Native of Gold Coast. J. W. S. Macfie.—p. 12.
10 Significance of Lymphatic Glands Situated on Anterior Surface of Atlas. A. E. Maylard.—p. 13.
11 *Death After Salvarsan. M. D. Wadia.—p. 13.

3. Treatment of Malaria by Tartar Emetic.—An apyrexial case of malaria showing numerous crescents in the blood treated with tartar emetic intravenously is cited by Rogers. On the fourth day 4 cg. of tartar emetic were given intravenously; 8 cg. on the fifth and eighth days, respectively, and 12 cg. on the eleventh day. A case is cited of acute malignant tertian infection yielding to quinin, with subsequent appearance of numerous crescents, which disappeared after two intravenous injections of 8 cg. tartar emetic, one on the second and one on the ninth day. Rogers is of the opinion that quinin should be used to check the malarial paroxysms, while tartar emetic should subsequently be given intravenously, in the hope that it may prove of value in destroying the extracorpuscular stages of the malarial parasites, and so prevent relapses, and greatly lessen the infectiveness of the patient to malaria-bearing mosquitoes, by killing the crescents of the malignant tertian variety and the corresponding resisting forms of the other types of malaria. Two additional cases are cited.

6. **Keeping Qualities of Therapeutic Serums.**—The question of the loss of antitoxin which occurred in samples of diphtheria antitoxin which had been in commerce for various periods was investigated by MacConkey. The average period during which these serums were on the market was about two and a half years, and the average loss in unitage during that period was about 23 per cent., or about 10 per cent. per annum. Nothing is known about the conditions under which these serums were stored while in commerce, but it is obvious that the rates of deterioration varied greatly. MacConkey

concludes that unless one knows how serum has been stored the putting on the label of a time expiry limit tells nothing, and may lead to a false sense of security. Kept under similar conditions, tetanus antitoxin loses its strength at about the same rate as diphtheria antitoxin. The loss which occurs on keeping is in the number of units only. The quality of the antitoxin remains the same, but the quantity is less. This decrease can easily be remedied by giving larger doses.

11. **Death After Salvarsan.**—Wadia's patient was given 0.5 gm. of salvarsan intravenously. He died thirteen days afterward. After a severe illness the symptoms suggesting acute yellow atrophy or phosphorus poisoning, but both were negatived by the fact of there being enlargement of the liver throughout, and also, as to the former, by the absence of leucin and tyrosin in the urine. Wadia suggests that there must have been a storage of arsenic in the liver, giving rise in all probability to acute fatty degenerative changes in the cells.

Edinburgh Medical Journal

January, XVIII, No. 1

12 Causation of Naegele and Robert Pelves. D. B. Hart.—p. 4.
13 *Prognosis in Disseminated Sclerosis; Duration in Two Hundred Cases of Disseminated Sclerosis. B. Bramwell.—p. 16.
14 Dr. Pascal Rougon: Zola's Study of Savant. J. B. Adams.—p. 23.
15 Case of Sporotrichosis. D. M. Greig.—p. 42.
16 Case of Suture of Perforating Wound of Heart. J. Fraser.—p. 47.
17 Simulation of Acute Appendicitis by Suppuration at Abdominal Inguinal Ring, Following Gonococcal Affection of Ductus Deferens. J. W. Dowden.—p. 49.

13. **Prognosis in Disseminated Sclerosis.**—In 200 cases analyzed by Bramwell the results up to the present date are as follows: 106 of the 200 patients have died; 64 patients are known to be still alive, and in 30 cases the result is not known. Of the 64 patients known to be still alive, 42 are much worse, 12 are in *statu quo*, 7 are greatly improved and 3 quite well. The average duration of the disease in 170 (fatal and nonfatal) cases is, up to the present date, twelve years and one month. In 1 patient the duration of the disease was thirty-seven years, and in no less than 14 cases the disease has lasted for more than twenty-five years. In the 106 cases in which the disease proved fatal the average duration was ten years and eight months; the shortest duration was seven months, and the longest duration was thirty-seven years. In 23, or 21.6 per cent., of the 106 fatal cases, the disease terminated in less than five years; in 54, or 50.9 per cent., of the 106 fatal cases in less than ten years; in 78, or 73.5 per cent., of the 106 fatal cases, in less than fifteen years; and in 92, or 86.7 per cent., of the fatal cases, in less than twenty years. Bramwell cites the histories of two patients in whom a permanent cure seems to have taken place, and of 2 patients in whom the disease lasted, respectively, for thirty-seven and thirty-four years.

Indian Medical Gazette, Calcutta

December, 1916, LI, No. 12

18 Surgery at Siege of Kut. C. H. Barber.—p. 441.
19 Sandfly Fever and Dengue. W. L. Harnett.—p. 444.
20 General Paralysis of Insane in Federated Malay States. W. F. Samuels.—p. 453.
21 Present Day Glaucoma Operations. B. P. Banaji.—p. 455.
22 Intravenous Injection of Eusol. C. Barry.—p. 457.
23 Case of Pellagra at Alipore Jail. J. Roy.—p. 458.
24 Case of Kala-Azar Treated by Intravenous Injections of Tartar Emetic. T. Jackson.—p. 459.
25 Serum for Diagnostic Purposes. D. J. Asana.—p. 459.
26 Blackwater Fever. J. N. Dutt.—p. 460.

Medical Journal of Australia, Sydney

December 9, 1916, II, No. 24

27 Cerebrospinal Fever in Military Camps and Country Hospitals of New South Wales. W. S. Brown.—p. 487.
28 Treatment of Thirty-Five Cases of Cerebrospinal Meningitis. R. E. Nowland.—p. 489.
29 Administrative and Epidemiologic Aspects of Cerebrospinal Fever. W. G. Armstrong.—p. 492.
30 Etiology and Epidemiology of Cerebrospinal Fever. J. B. Cleland.—p. 496. To be continued.

December 16, 1916, No. 25

31 Id. J. B. Cleland.—p. 516.

Lancet, London

January 6, I, No. 4871

32 Conditions which Govern Growth of Bacillus of "Gas Gangrene" in Artificial Culture Media. A. E. Wright.—p. 1.
33 Orthopedic Methods in Military Surgery. D. M. Aitken.—p. 10.
34 *Six Cases of Ameba Histolytica Carriers Treated with Emetin Bismuthous Iodid. C. G. Imrie and W. Roche.—p. 17.
35 Surface Tension and Wassermann Reaction. V. B. Nesfield.—p. 18.
36 Traumatic Hernia of Diaphragm Proving Fatal Seven Months After Wound. C. P. Symonds.—p. 18.
37 Blood Changes in Gas Poisoning. J. Miller and H. Rainy.—p. 19.

34. **Ameba Histolytica Carriers.**—Emetin bismuthous iodid was administered by Imrie and Roche in doses of 3 grains on twelve successive nights to six patients. When given immediately after a light supper its administration was always followed with nausea and in some cases vomiting. These undesirable symptoms were least in evidence when the patients received the drug with water at 10 p. m. Five of the patients ceased to pass *Entameba histolytica* in the active or encysted form forty-eight hours after the institution of treatment. The sixth patient continued to pass cysts for six days, after which the microscopic findings were negative. These observations have a greater significance when it is remembered that four of the patients had previously received a course of emetin hydrochlorid, despite which they continued to pass the entameba in its active or encysted stage.

Bulletin de l'Académie de Médecine, Paris

December 19, 1916, LXXVI, No. 50, pp. 519-570

38 *Chloridimeter. (Chlorurimètre.) Agasse-Lafont, Douris and Hayem.—p. 521.
39 *Relations between Erythematous Lupus and Inherited Syphilis. E. Gaucher.—p. 529.
40 War Deafness. (Recherches expérimentales et histologiques sur la commotion du labyrinthe.) Prenant and Castex.—p. 535.
41 Extraction of Foreign Body in Right Bronchus under Intermittent Radioscopy. M. Cazin.—p. 537.
42 *Infant Welfare Work in Paris. (De la protection de l'enfance pendant la deuxième année de guerre dans le camp retranché de Paris.) A. Pinard.—p. 540.

December 26, No. 51, pp. 571-593

43 *Bedside Estimation of Chlorids in the Urine. (Sur la chlorurimétrie clinique.) C. Achard.—p. 572.
44 *Syphilis after Two Years of War. E. Gaucher and Bizard.—p. 575.
45 The Oculocardiac Reflex after War Wounds of the Skull. (Le réflexe oculo-cardiaque et les troubles subjectifs des trépanés.) P. Sainton.—p. 583. See Paris Letter, p. 384.
46 Gas Gangrene; Statistical Study. G. Gross.—p. 586.
47 Operative Cure of Cicatricial Stenosis of the Larynx. E. J. Moure.—p. 591.

38. **Chloridimeter.**—An instrument for bedside use is described with which the chlorid content of the urine or other fluid can be easily estimated with the usual chemical tests. The chloridimeter is a glass tube, graduated in two divisions. The tube is filled to the lower mark U with the urine and then to the mark R with the reagent. They are mixed by reversing the stoppered tube a few times. The tube is graduated from 1 to 20 above the mark R. The second reagent (29.075 gm. silver nitrate and distilled water Q. S. for 1,000 gm.) is added a little at a time. It tints the fluid red, but this disappears as the contents are mixed. By adding more and more the red tint becomes more pronounced and more durable. The figure marked at the point reached by the fluid when the tint has become stable is the index of the chlorid content in grams per liter of the fluid being analyzed. The first reagent is a mixture of 2 gm. potassium bichromate; 3 gm. acetic acid; 10 gm. sodium acetate, and distilled water Q. S. for 1,000 gm. The same tube is graduated, besides, like the Esbach tube and is used in the same way to determine the albumin content. (See abstract 43 below.)

39. **Erythematous Lupus.**—Gaucher presents evidence to show that this affection may be of purely tuberculous origin, or due solely to inherited syphilis, or it may be of tuberculous origin on a soil of inherited syphilis.

42. **Welfare Work for Young Children, and Infantile Mortality in Paris District.**—Pinard reviews the work that has been done to promote infant welfare during the second year of the war, devoting over forty pages to the various measures enforced and the statistics of the last three years. They

show that 50 per cent. more children were abandoned in 1916 than in 1914, while the number of births was 50 per cent. less. The high wages paid in the munitions factories he regards as responsible in large measure for this state of things, and he declares that the only remedy is to forbid factory work for every pregnant woman, every nursing mother, and every woman who has borne a child within six months. The infant mortality under 1 year of age is lower than in previous years.

43. **Chloridimeter.**—Achard describes perhaps the simplest form of chloridimeter, and emphasizes the advantages of bedside examination of the urine which he has been preaching, he declares, for fourteen years. His chloridimeter is a test tube and he uses always 3 drops of the 20 per cent. solution of potassium chromate and 5 c.c. of the standard solution of silver nitrate. The urine is then added until the reddish brown tint veers to a clear yellow. The tube is graduated to show the amount of urine required for this color reaction. By thus modifying the usual technic, letting the urine be the variable quantity, the test is rendered much simpler and much more convenient, he says, without detracting from its reliability. The urine can be diluted if exceptionally concentrated, or the nitrate solution can be diluted if the reverse prevails, calculating to allow for this. (See abstract 38 above).

44. **Venereal Disease After Two Years of War.**—Gaucher and Bizard say that just before the war, in a series of 3,000 patients in their service, 10 per cent. were syphilitic. In the first sixteen months of the war this proportion had increased to 16⅔ per cent., and in the last eight months to 25 per cent. of 2,300 patients. This last series of 600 syphilitics includes 219 civilians, thirty-seven under 20 years of age, and fourteen between 50 and 59, with one each of 64 and 66. Among the soldiers those over 25 furnish the largest contingent. Among 222 women with recent syphilis during the first eight months of 1916, more than two thirds were married, and in a large proportion of cases the first symptoms were noted soon after the husband's brief visit home. A third of these women were over 30 years old, further testimony to the probability of infection having occurred under legitimate conditions.

Gaucher emphasizes also the extraordinary prevalence of gonorrhea in both men and women, and expatiates on the necessity for enlightening the public as to its dangers, and, last but not least, on the necessity for teaching physicians to diagnose and treat it properly. He has been appalled at the ignorance of the dangers of venereal disease which has been revealed by inquiry among the young men examined. A number of instances are cited showing further that syphilitic eruptions and other lesions in both men and women had long been given futile treatment on a mistaken basis, throat lesions, leg ulcers, alopecia, which subsided at once under specific measures. The negative statements of patients should never be heeded. He insists that every physician should take a course of training in some service for syphilography, especially now that there is reason to fear that syphilis is going to be carried into the remotest villages. He pleaded with the authorities a dozen years ago to have a course in skin diseases and syphilis included in the fourth year of the medical course. All agreed with him as to its advisability, but nothing was done, he remarks, "as it is the custom in France to take no steps to prevent evil, and to wait until it is done before seeking to remedy it." He adds that the war alone is not responsible for this increase in syphilis; it has only precipitated it.

Lyon Médical, Lyons

December, 1916, CXXV, No. 12, pp. 513-560

48 The Chemical Industry in France and in Germany. P. Garnal.—p. 513. Concluded.

Paris Médical

December 30, 1916, VI, No. 53, pp. 561-576

49 Extraction of Projectiles. (L'extraction des projectiles sur le front.) G. Réchou.—p. 562.

50 *Pneumococcus Infections in African Troops. (La pneumococcie chez les tirailleurs de l'Afrique occidentale. Observations cliniques et thérapeutiques.) G. Boyé and G. Clarac.—p. 568.

51 Shiny White Lichen Planus. (Lichen porcelainé.) H. Gougerot.—p. 571.

52 Spontaneous Cure of Shell Vesicorectal Fistula with Retention Catheter and Wide Infrarectal Drain. (Fistule vésico-rectale par éclat d'obus guérie par des moyens simples.) A. Beckel.—p. 573.

50. **Pneumococcus Infections and Abuse of Cola.**—Boyé noticed that the native troops from western Africa suffered exceptionally from extreme cardiovascular weakness during pneumonia. He traced this to the lack of cola nut which they take habitually at home, often in excessive quantities. The pneumococcus infections were mild, and as soon as he allowed the men a certain amount of cola nut they rapidly recuperated. Chronic cola intoxication was thus demonstrated to be responsible for the cardiac instability, and by giving them this stimulant to which they were accustomed, they were tided past the danger point.

Berliner klinische Wochenschrift

November 27, 1916, LIII, No. 48, pp. 1285-1308

53 *Ulcerative or Suppurating Colitis. R. Ehrmann.—p. 1285.

54 *New Finger Made from Rib Engrafted in Abdominal Wall. (Ein neues Operationsverfahren zum Ersatz von Fingerverlusten.) H. Neuhäuser.—p. 1287.

55 *Hyperleukocytosis with Internal Hemorrhage. (Die Leukocytenreaktion nach inneren Blutungen.) H. Dold.—p. 1290.

56 *Advantages of Repeated Lumbar Puncture in Treatment of Epidemic and Other Meningitis. (Beitrage zur Pathologie und Therapie der Hirnhautentzündung, insbes. der epidemischen Genickstarre.) H. Mühsam.—p. 1293.

57 Recent Research on the Heart. (Neuere Arbeiten über Herzdiagnostik mit bes. Berücksichtigung der praktisch verwendbaren Methoden.) F. Geppert.—p. 1298.

53. **Ulcerative Colitis.**—Ehrmann discovered some connection with dysentery in all but one of his cases of ulcerative colitis. Either agglutination tests, the anamnesis or the necropsy findings gave conclusive evidence in this respect. In several of the cases blood had long been passed in the stools at certain periods. In some of the cases the infection had been mainly with the Flexner or Y bacillus, and yet the suppurating and ulcerating colitis was as grave as in the cases traceable to true dysentery.

54. **Making a New Finger.**—Neuhäuser extols the advantages of a method with which a strip of a rib is transplanted into a fold of abdominal skin, and this in turn is sutured to the stump of the lost finger. The hand can thus be fastened to the abdomen with the minimum of discomfort, while the results, when the new finger was cut away from the abdominal wall, were satisfactory in the case described, with illustrations.

55. **Leukocytosis with Internal Hemorrhage.**—Dold has confirmed on dogs and rabbits the rise in the numbers of leukocytes when internal hemorrhage has occurred. This leukocytosis is manifest even with relatively slight internal hemorrhage. It reaches its height in from eight to twenty-four hours, and has entirely subsided by the end of the fourth day. He explains this leukocytosis as due to absorption of leukocyte-attracting products from the disintegration of albumin in the extravasated blood. He thinks that it is destined to be quite an aid in diagnosis of internal hemorrhage.

56. **Treatment of Meningitis.**—Mühsam states that the mortality was 56 per cent. in his numerous cases of epidemic meningitis in which intraspinal serotherapy was applied by the usual technic. On the other hand, it was only 5 per cent. in the numerous cases in which daily lumbar puncture was done, withdrawing large amounts of fluid, up to 100 c.c. at a time. He never witnessed any serious mishaps from it. Mixed infection was quite common. He adds that he is not allowed to give his figures, but that the numbers are large enough to warrant decided statements as to the value of thus evacuating the noxious fluid in these cases.

Deutsche medizinische Wochenschrift, Berlin

December 7, 1916, XLII, No. 49, pp. 1501-1532

58 *The Coordinated Reflexes of the Human Lumbar Spinal Cord. Böhme.—p. 1501.

59 Monocyte Leukemia? Bingel.—p. 1503. To be continued.

60 Acute Nephritis in the Troops. Rostoski and Pantaenius.—p. 1505. To be continued.

61 The Blood Picture after Radiotherapy of Uterine Cancer. (Die Bewertung des Blutbildes nach Bestrahlung beim Uteruskarzinom.) F. Heimann.—p. 1507.

62 *Elimination of Uric Acid In Disease of Glands with an Internal Secretion. (Ueber Harnsäureausscheidung bei einigen Fällen von Blutdrüsenerkrankungen.) J. Nowaczynski.—p. 1510. Commenced in No. 48,—p. 1478.
63 Astringent Action of Aluminum Formate. A. Loewy.—p. 1512.
64 Occupation Therapy for Soldiers with Nervous Affections. (Arbeitstherapie für nervenkranke Soldaten.) P. Jolly.—p. 1514.
65 Diaphragm for Stereoscopic Roentgenography. (Blende zur Anfertigung stereoskopischer Röntgenaufnahmen.) K. Lossen.—p. 1517.
66 Five-Day Fever Described in 1904 as "Relapsing Influenza." (Zur Frage der Febris wolhynica—His.) E. Apolant.—p. 1518.

58. **Coordinated Reflexes.**—Böhme's experience has apparently demonstrated that the motor reflexes in the legs are alike in man and in animals, the coordinated reflexes in particular. A particularly instructive case of myelitis is described which left the boy of 8 with complete paralysis of the left leg and also of the right except that it can be flexed a very little at the hip. There is also paralysis of the rectum and bladder sphincters. This condition has persisted for five years to date. The tendon reflexes are exaggerated, and there are occasionally involuntary movements of the legs. On stroking the sole, the hip and knee become flexed, with dorsal flexion of foot and toes, and this same coordinated reflex movement of whole sets of muscles can be elicited when the skin of the leg or of the lower abdomen is irritated. With gentle stroking the reverse reflex movement is elicited. A strong stimulus causes flexion, a weak stimulus extension. The extension reflex is tonic; the limb remains in the extension position even when it has been passively induced. The other leg becomes slightly flexed as the one leg becomes extended, and vice versa. Eliciting with strong irritation the flexion reflex in one leg, induces extension in the other. With the patient lying on his back, both legs fully extended, application of the electric current to the sole of one foot causes flexion of this leg and, a trifle later, of the other also. With both legs flexed, gently stroking one sole causes rapid and extreme extension of both legs. The crossed and double reflex movements and coordinated reflexes observed in this case throw light on the mechanism of crippling contracture, etc. They also suggest treatment of paralysis by eliciting coordinate movements instead of merely stimulating the separate muscles. Böhme suggests practicing the limb with reflex flexion and contraction. Study of the arm reflexes in the animal kingdom has shown that those which are no longer needed for man have been lost. In four-footed animals the front legs require the same reflex phenomena as the hind legs, but in man, as he does not use his arms in walking, the arm reflexes differ essentially from the leg reflexes. There are no crossed reflexes in the arms, while the leg reflexes in man seem to be identical with those in animals, and their retention indicates some biologic importance.

62. **Organ Therapy of Disease of Endocrine Glands.**—Nowaczynski investigated in particular the elimination of uric acid in seven cases of exophthalmic goiter, dystrophia adiposogenitalis or Addison's disease, under organ therapy. No essential influence on the elimination of uric acid under these conditions could be detected. In a few cases there was increased elimination, but the material is too small for conclusions.

Medizinische Klinik, Berlin

December 3, 1916, XII, No. 49, pp. 1275-1302

67 Perforation of Unicornus Uterus during Removal of Placenta. O. v. Franqué.—p. 1275.
68 *Diabetes in Children. (Diabetes mellitus im Kindesalter.) H. Kleinschmidt.—p. 1277.
69 War Wounds of the Skull. (Ueber Schädelverletzungen im Gebirgskriege.) E. Rychlik and A. Löwenstein.—p. 1279.
70 Paratyphoid A; Thirty-One Cases. (Paratyphus A.) J. Schmautzer.—p. 1282.
71 Diagnosis of War Wounds of the Abdomen. (Diagnostik der Bauchschüsse.) K. Hanusa.—p. 1284.
72 Optochin in Pneumonia. A. Stühmer.—p. 1286.

68. **Diabetes in Children.**—In the course of the last three years Kleinschmidt has had fourteen diabetic patients between the ages of 2 and 14 years, nine boys and five girls. Only two of the children were from well-to-do families and only one was from a Jewish family. In five of the cases the diabetes was kept under control and the children look well; they have been under observation for from three to twenty months. In two other cases the diabetes was of a moderately severe type, but in the seven others it was very severe. In children the transition from the mild to the severe type occurs more rapidly than in adults. In some of the cases the diabetes had not been recognized until after this transition had occurred. There was a history of diabetes in the progenitors in two cases and of obesity in one. Treatment has to be strictly individualized as the key to success is quantitative regulation of the diet, calculating at 70 the calories required for a year old child and 35 calories per kilogram for an adult.

For the qualitative regulation he calculates 2 gm. albumin per kilogram for older children and 3 gm. per kilogram for younger children, giving it in the form of meat, egg and cheese, with abundance of vegetables and fruit and at first 100 gm. bread or potatoes or oatmeal, making up the rest of the calories with fat, preferably butter. When the child is taking this diet regularly, it is easy to determine its tolerance of carbohydrates by testing the limits of tolerance. This is best done in an institution; the limit once established, the treatment of the mild types can be continued at home under regular control of the urine. One girl of 6 was able to take, along with the vegetables and fruit, 150 gm. bread and 100 gm. potato; another of 7 takes 30 gm. oat flakes, 50 gm. bread and 50 gm. potato. Others have been able to bring the tolerance to a high point. There was no glycosuria in one girl of 11 even after test ingestion of 420 gm. wheat rolls with 50 gm. grape sugar.

The children seemed to be thriving after the tolerance had been determined and the level kept below this. They attended school part of the time and stood well in their studies. Some of them increased in weight by several pounds, but two showed no increase, and the temperature was sometimes inclined to be subnormal. But none of the children lost the tendency to glycosuria; it returned on the slightest provocation even after weeks or months, brought back by a fright, disappointment about a journey, or a bad school report, but most frequently by some slight intercurrent catarrhal affection, parotitis or diarrhea. It was easy to restore the tolerance again, but the accumulation of such disturbances must gradually permanently reduce the level of tolerance. Hence a tendency to even slight catarrh of the upper air passages must be regarded as a serious complication for diabetes in children. In three of his cases measles had a decidedly unfavorable effect; in one, the diabetes was first discovered after measles. In a case reported by Naunyn, varicella entailed fatal acidosis, and in Starck's case whooping cough had this effect, but in one of Kleinschmidt's cases the girl of 7 passed through severe hemorrhagic uremic nephritis without return of the glycosuria. This child had a suppurating skin affection, besides the diabetes.

In the severe forms, vegetable days and oatmeal days sometimes prove of benefit, but the oatmeal failed completely in the case of one child between 2 and 3. He gave sodium bicarbonate or sodium or potassium citrate whenever the urine was found acid. The acidity of the urine is a simple and exact gage of the acidosis, and thus of the danger threatening the child. In six of his cases it proved impossible to render the urine alkaline, even with 40, 60 or 80 gm. of the alkali, and coma soon followed. In this stage no influence was apparent even from intravenous injection of a 5 per cent. solution of sodium bicarbonate. Aside from the alkali, he knows of no effectual drug treatment of diabetes. Whether diabetes is liable to develop later in life when children have shown alimentary glycosuria or transient glycosuria during an infectious disease or as a symptom of myxedema, is still a question. He has so far seen no tendency of the kind in cases long under observation.

Münchener medizinische Wochenschrift, Munich

November 28, 1916, LXIII, No. 48, pp. 1685-1716

73 The Pituitary Body as Regulator of Diuresis and of the Specific Gravity of the Urine. H. Bab.—p. 1685. To be continued.
74 *Treatment of Secondary Anemia by Intragluteal Injections of Nondefibrinated Blood. H. Köhler.—p. 1688.
75 Combating a Cholera Epidemic. Bofinger.—p. 1689.

76 *Prevention and Treatment of Whooping Cough. (Zur Verhütung und Behandlung des Keuchhustens.) E. Doernberger.—p. 1691.
77 *Combating Venereal Diseases. (Bekämpfung der Geschlechtskrankheiten.) L. v. Zumbusch and A. Dyroff.—p. 1692.
78 Treatment of Erysipelas with "Quartz Lamp." (Behandlung des Erysipels mit der Quarzlampenbestrahlung.) F. König.—p. 1701.
79 Early Treatment of Abdominal Wounds. (Beobachtungen und Resultate bei frühzeitig eingelieferten Bauchschüssen.) Oberst. —p. 1702.
80 The Tendency to Scoliosis after Amputation of an Arm or Leg. (Ueber skoliotische Haltung einseitig Amputierter.) P. Erlacher. —p. 1705.
81 Treatment of Acute Dysentery. (Zur Behandlung der akuten—dysenterischen—Darmentzündungen im Kriege.) A. Plehn.—p. 1707.
82 Obscure Febrile Affections. (Ueber unklare fieberhafte Erkrankungen.) E. Becher.—p. 1708.
83 Optochin in Pneumonia; Ninety Cases. B. Leick.—p. 1710.
84 "Five-Day Fever"; Two Cases. E. Scheube.—p. 1712.
85 Gaseous Abscess of the Brain; Two Cases; Recovery. E. Rychlik. —p. 1713.
86 Immobilizing Dressing for Fractured Femur. (Transportverbände bei Oberschenkelfrakturen.) S. Weil.—p. 1714.
87 Technic for Examining the Blood in Malaria. H. Lipp.—p. 1715.

74. Intragluteal Injections of Blood in Secondary Anemia.—Köhler has only two cases to report, but the benefit was so prompt and permanent and the technic so simple that he commends the measure for general adoption. No attempt was made to defibrinate the blood. The donor was the sister in one case. A single injection answered the purpose here; the reds had dropped to 1,188,000 and the hemoglobin to 20 per cent. after constant losses of much blood at the first menstruation. By the fifth week after the intragluteal injection of blood the figures were 4,320,000 and 65 per cent. The other was a maternity case with septic streptococcus endometritis, reds 1,100,000, hemoglobin 15. Eight injections were made at four-day intervals, to a total of 150 c.c. of blood. In two months the reds ran up to 3,276,000, the hemoglobin to 50, and the improvement progressed afterward.

76. Whooping Cough.—Doernberger remarks that nothwithstanding the recommendations by the manufacturing chemists of dozens of remedies, ending in "in," "on" and "ol," claimed to be specifics for whooping cough, with testimonials as to their efficacy signed by reputable physicians and distributed broadcast, still as ever, the best means of relief, not cure, is pure air free from dust and soot. But this is hard to get, in the homes of the poor, and health resorts are more and more disinclined to receive whooping cough cases, to say nothing of the danger of contagion of others in cars and trains on the way to health resorts. He suggests as a useful measure that a certain part of some public park be fenced off for whooping cough children and their attendants. Roof gardens have also been proposed. He cites the placards in use in Havana to show that certain places regard whooping cough seriously. The public health service there posts a notice on the bill boards stating that whooping cough is epidemic in a certain district, and warning against it, especially for young children, also giving directions for the children affected. The placard on the whooping cough house also gives directions for preventing contagion of others.

77. Necessity for Including Venereal Diseases Among those Requiring Compulsory Notification and Compulsory Treatment.—This communication was translated nearly in full for the Social Medicine and Medical Economics Department, January 27, p. 306. Zumbusch is professor of skin diseases and syphilis at the University of Munich and Dyroff is professor of state and constitutional law (*Staatsrecht*) there.

Zeitschrift für Tuberkulose, Leipzig

November, 1916, XXVI, No. 5, pp. 321-400

88 *Detection and Treatment of Tuberculosis in Children. (Erkennung und Heilung der Tuberkulose im Kindesalter.) J. Hollos.—p. 321.
89 *Changes in Blood Picture under Influence of Induced Pneumothorax. (Wirkung des künstlichen Pneumothorax auf das Blut der Tuberkulösen.) M. Gutstein.—p. 336.
90 Indications from Medical and Social Standpoints for Sanatorium Treatment of Pulmonary Disease. (Wer gehört—vom ärztlichen und sozialen Standpunkt betrachtet—in die Lungenheilstätte?) Litzner.—p. 367.
91 Cure of Lupus under Phototherapy. (Beitrag zur Lupusbehandlung mit künstlicher Höhensonne.) W. Kaufmann.—p. 370.

88. Detection and Treatment of Tuberculosis in Children.—Hollos emphasizes that the treatment of tuberculosis in children must include prevention of repeated infection as well as measures to strengthen the resisting powers besides systematic specific treatment. Every child known to be exposed to tuberculosis can be regarded as already infected. The more sensitive to toxic influences the child's organism, the greater the production of antibodies, and hence the tuberculous process does not spread so rapidly, but the various functional disturbances from the toxins are more pronounced. Such children are frail but they may live their whole life without the tuberculosis becoming manifest. Only when in consequence of unhygienic conditions, alcoholism, measles or pregnancy, the immunity is lowered is the tuberculosis able to get the upper hand. Sad examples of this are found in the soldiers with previously latent tuberculosis who return from the front with pulmonary phthisis.

Latent tuberculosis in children is often revealed by defects in development. The previously normal appearing child begins to grow thin and pale, the skin and muscles feel flabby, and the bones are inclined to soften and bend. The mind often develops precociously and the children are known as good scholars, while others are correspondingly backward. Children with latent tuberculosis "catch cold" readily, eczema and pruritus are frequent and there may be periods of some difficulty in breathing, with or without bronchial catarrh. Pains at different points are also instructive; by simulating appendicitis they have been known to lead to an unnecessary operation. Owing to the influence of the tuberculosis toxins on the genital organs, the picture of puberty may differ entirely from normal. These toxins can act on the glands with an internal secretion either to irritate them to exaggerated functioning or to inhibit their functioning, which explains why one child may grow tall and spindling under their influence while another may be short and stout. There may be extreme emaciation or there may be obesity, premature or long retarded puberty, frequent profuse menstruation or the menses may not commence until the sixteenth or eighteenth year or later and then occur at long and irregular intervals. In boys, early and repeated pollutions and sexual nervousness at puberty should arouse suspicion of latent tuberculosis.

All these disturbances in tissues and functions which are induced by tuberculous infection in the growing child, form as a whole the clinical picture of Stiller's "universal asthenia." Others call it the "lymphatic temperament." All seem to regard it as an inherited, congenital predisposition, a substandard constitution, when in fact it is merely the sum total of the disturbances induced by tuberculous infection during childhood. It is not a congenital anlage and an inherited body frame, but it is the results of the insidious sapping of an acquired disease. And this, he reiterates, is under our control if we recognize and attack it early enough with specific treatment.

89. Influence of Artificial Pneumothorax on the Blood.—Gutstein gives the minute details of his examination of the blood of twenty tuberculous patients being treated with induced therapeutic pneumothorax. In favorable conditions the number of reds rapidly and materially increased and the hemoglobin percentage also increased, but more slowly, while the total white count was reduced but the lymphocytes and eosinophils increased in numbers. These were the findings with a successful pneumothorax free from complications. When there were complications, these changes were not observed or the reverse was noted, the hemoglobin declining while hyperleukocytosis and lymphopenia developed. These changes in the blood picture are instructive for the prognosis. It should be guarded when the blood shows hyperleukocytosis with lymphopenia and the hemoglobin percentage is dropping.

Gazzetta degli Ospedali e delle Cliniche, Milan

December 17, 1916, XXXVII, No. 101, pp. 1585-1600

92 Pulsating Hematoma and Operative Treatment. G. Campora.—p. 1588.
93 *Treatment of Frozen Limbs. (Pei nostri congelati.) T. Silvestri. —p. 1592.

December 21, No. 102, pp. 1601-1616

94 *Epidemie of Hemorrhagic Disturbances in the Troops on Active Service. (Sindromi emorragiche ad insorgenza epidemica tra le truppe operanti.) P. D. Siccardi.—p. 1605.

December 24, No. 103, pp. 1617-1632

95 Epidemic Jaundice. (Sull'eziologia dell'ittero epidemico.) M. Ascoli and S. Perrier.—p. 1618.

93. **Freezing Injuries.**—Silvestri remarks that freezing injuries are the scourge of the troops in winter, and that every effort must be made to relieve at brief intervals the troops exposed to freezing temperatures, and have them move about, as keeping still favors freezing. Freezing of the first or second degree he has found always heals spontaneously, regardless of what local measures may be applied. They may relieve the suffering, however. This is not always proportionate to the gravity of the injury but depends more on the man's sensitiveness to pain. Everything should be avoided—bandages, etc.—that tend to have the limb kept still. Massage, possibly with some sedative salve, and movements—these are the sovereign means of cure, supplemented when needed by scarification of the blisters, application of an absorbing powder, an extremely light protecting dressing and raising the foot, if there is much edema, with early active exercise. The men should not be allowed to stay in bed during the day; movement is the best of all measures, and although it may be painful at first, it soon relieves the suffering and hastens the cure. It is not enough to advise the men to keep up and about; they must be made to do it. With freezing of the third degree, the dressing must also be light, permitting ample access of air. The limb should be raised but not covered. Silvestri has found calcium salts very useful in treatment of severe freezing, with or without strychnin to improve vasomotor tonus. Both should be given freely but he warns against giving antitetanus serum in case of freezing of the second and third degrees.

94. **Hemorrhagic Affections in the Italian Troops.**—Siccardi noticed last summer the epidemic appearance of a transient hemorrhagic diathesis among the troops serving at the highest altitude among the mountains. Whatever affection the men might be having, a hemorrhagic character was strikingly evident. Hemorrhagic scurvy formed 2.5 per cent. of the cases, and a "hemorrhagic parascurvy," as he calls it, formed 42 per cent. The symptoms were the same as in true scurvy, but the general health was not impaired and in 29 per cent. there was no stomatitis. In 51 per cent. of the cases there was typical exanthematous purpura. The course in all the cases was benign. Rest and dieting seemed to be all that was necessary. Defective ventilation of the underground shelters, the cold and damp, wet feet, wet clothes, and the unbalanced diet easily explain the tendency to these troubles. Rest, dry warmth and change of diet soon restored normal conditions as a rule. Bacteriologic tests were constantly negative except in a small group of 0.5 per cent. who presented infectious hemorrhagic skin lesions with typhoid plus paratyphoid B in some cases. Of the total number of men with this hemorrhagic tendency, 4 per cent. were in the frozen limb group, weak, but with no signs of sepsis.

Pediatria, Naples

November, 1916, XXIV, No. 11, pp. 641-704

96 *Improved Technic for Intubation for Stenosis of the Larynx. (Terapia delle stenosi laringea col metodo Bellotti-Isonni modificato.) L. Leto.—p. 641.

97 *Study of the Meningococcus in a Recent Epidemic of Meningitis. (Comportamento morfologico e biologico dei meningococchi di Weichselbaum, isolati durante l'epidemia di meningite cerebro-spinale scoppiata in Palermo nell'anno 1915-1916.) G. Rutelli.—p. 650.

98 Multiple Cerebral Tuberculomas. A. Corica.—p. 660.

99 *The Hemolyzing Power of Certain Preparations of Antimony Used in Therapeutics. G. Caronia.—p. 667.

96. **Improved Technic for Intubation with Stenosis of the Larynx.**—With Leto's modification of the Isonni technic, a long, curved needle is worked through the thyrohyoid membrane a few millimeters below the margin of the hyoid. The forefinger in the pharynx serves as guide to the needle and obviates any injury of the throat. As the needle enters the throat it is drawn out through the mouth, and the long silk thread it brings with it is fastened to the laryngeal tube. The tube is then easily introduced, aided by pulling on the silk coming out through the thyrohyoid membrane below. The silk is then tied over a strip of gauze fastened like a cravat around the throat. The tube is thus held firmly in place. In one of the four cases of membranous croup described in which intubation was done by this technic, the tube had to be worn for six weeks. The silk became macerated during this period but the procedure was easily repeated. Nothing was found to suggest injury from the introduction of the needle, not even in the one case that came to necropsy.

97. **Epidemic Meningitis.**—Rutelli isolated Weichselbaum's meningococcus in thirty-seven of the nearly eighty cases of meningitis in a recent epidemic at Palermo, and he tabulates the morphologic and biologic peculiarities of the coccus and various features of the disease. They demonstrate that the meningococci in various epidemics differ biologically in certain respects, showing that antiserums should be made from the special strain involved. Only when the antiserum is made from the patients' own meningococci can it be depended on to be actually effectual in a given epidemic.

99. **Correction of Hemolyzing Property of Antimony.**—Caronia reports experiments which show that the pronounced destruction of the blood corpuscles liable with intravenous injection of preparations of antimony can be prevented by addition of salt. He advises using a weak solution of the antimony preparation, not over 0.5 or 1 per cent., in a 0.7 or 0.75 solution of sodium chlorid. He experimented mostly with antimony and potassium tartrate.

Policlinico, Rome

December, 1916, XXIII, Medical Section No. 12, pp. 409-448

100 Organic Nervous Disturbances Following War Wounds of the Brain. (Sindromi nervose organiche consecutive a lesioni—da proiettili—del cervello.) G. Mingazzini.—p. 409.

101 *Painful Subcutaneous Nodules with General Depression. (Ricerche cliniche sopra un caso di "adipositas dolorosa"—morbo di Dercum.) F. Alzona.—p. 429.

December, Surgical Section No. 12, pp. 353-392

102 *Correction of Congenital Pseudoarthrosis of the Tibia. G. Serafini.—p. 353.

103 *Urea Test of Kidney Functioning. (La prova dell'azoturia come metodo di esame della funzioni renale.) E. Pirondini.—p. 368.

104 Interscapular-Thoracic Amputation for Primary Epithelioma of the Head of the Humerus. (Contributo clinico all'amputazione interscapulo-toracica ed istopatologico ai tumori epiteliali primitivi delle ossa.) N. Giannettasio.—p. 371.

101. **Adiposis Dolorosa.**—Alzona reports what he classes as a case of Dercum's disease in a soldier of 26 in the trenches. During the last seven months small, very painful bunches have developed at various points under the skin, sparing only the face, upper arms and shoulders. The appearance of each of the small swellings is preceded by a period of pain in the region and the pain persists. The man tires readily and has pains in the lumbar and heart region. His mother and one brother are epileptics and the man himself has had attacks and has passed through typhoid twice. Epinephrin and atropin displayed slight if any action, but pilocarpin accelerated the heart beat and induced nausea, general malaise and profuse salivation and sweating. The metabolic findings under each of these drugs are tabulated and compared with those reported in other cases of the kind. Few if any have been studied at such an early stage.

102. **Pseudarthrosis of the Tibia.**—The bones refused to heal after a fracture of the tibia just above the ankle in a girl of 6, and by the age of 16 the foot swung outward almost at a right angle from the leg. The pseudarthrosis prevented any use of this foot. The fibula curved but was intact. A broad wedge was cut out of it and the tibia was resected above and below the pseudarthrosis. With this operation approximately normal conditions were restored and the leg can now be used normally with a high sole. He regards the trouble as of congenital origin as nothing else explains the complete lack of consolidation, and the fracture occurred with such slight trauma that it was almost spontaneous.

103. **Urea Test of Kidney Functioning.**—Pirondini called attention two years ago to the valuable information to be derived by experimental azoturia. He gives for the test 300 c.c. of distilled water in which have been dissolved 10 gm. of urea. (The test was described in THE JOURNAL, 1915, **65**, 835.) He here reports the details of four cases in which this test gave most instructive findings, harmonizing with the Ambard index throughout. One of the cases had forensic interest, the woman claiming large damages for alleged cantharidin poisoning of the kidney. The azoturia test showed normal conditions in the kidneys, confirming other findings.

Revista de la Asociacion Medica Argentina, Buenos Aires

November, 1916, XXV, No. 144, pp. 459-586

105 *Local Anesthesia for Operations on the Neck. (Anestesia local regional e infiltrativa en las operaciones de cuello.) J. M. Jorge. —p. 459.
106 Sarcoma of the Iris. (Caso de leucosarcoma del iris.) R. Argañaraz.—p. 471.
107 Delivery at Term with Uterus Pseudo-Didelphys. (Embarazo a termino en un utero bicornio bicervical.) E. A. Boero.—p. 485.
108 Sensory Hemiplegia. (Hemiplejias sensitivas.) M. R. Castex and N. D. Rosso.—p. 495. Continuation.
109 Serum Reactions in Leprosy. (Investigaciones serologicas en la lepra.) A. Sordelli and G. Fischer.—p. 558.
110 Hematometra in One Side of Double Uterus. (Hematometria unilateral.) O. L. Bottaro.—p. 570.

105. **Local Anesthesia for Operations on the Neck.**—Jorge comments on the gratifying way in which local anesthesia is extending its scope in the surgical services. He prefers as a rule the infiltration technic, the patient under the influence of some sedative, but for operations on the neck the paravertebral technic has proved its superior advantages. The nerves forming the cervical plexus are blocked by injecting the anesthetic at two points on a line from the posterior margin of the mastoid to the lateral tubercle of the sixth cervical. The points are at the intersection of two horizontal lines, one passing along the inferior margin of the lower jaw, and the other passing along the most pronounced portion of the thyroid cartilage. The needle is pointed toward the anterior plane of the transverse processes, and 4 or 6 c.c. of the 1 or 2 per cent. novocain-epinephrin solution are deposited thus in the plexus zone. This nerve-blocking procedure has to be supplemented by infiltration anesthesia of the operation field. With this technic he has safely excised enormous goiters, congenital cysts and enlarged glands and excised the sternocleidomastoid muscle, extracted foreign bodies and resected cancers—a total of over 100 operations on the neck, some two hours long.

Siglo Medico, Madrid

December 9, 1916, LXIII, No. 3287, pp. 785-800

111 *Changes in the Blood Picture as a Guide in Prognosis. (La linea de resistencia de Sondern en la apendicitis.) L. Cardenal.—p. 785.
112 Endemic Malaria in Spain. E. Luengo.—p. 787. Concluded in No. 3288, p. 808.
113 The Ethical and the Vicious Press. (La buena y la mala prensa.) C. Juarros.—p. 791.

111. **Changes in the Blood Picture as Aid to Prognosis.**—Cardenal relates that his clinical experiences have confirmed the instructive bearing of Sondern's line of resistance in estimating the defensive forces of the organism during an attack of appendicitis, for example. He gives a typical chart, and reiterates that slight changes in the relative blood count indicate mild infection; a slight increase in the numbers of neutrophils, and of leukocytes in general, indicates a good organic resistance and mild infection; slight neutrophilosis and pronounced leukocytosis, mild infection and strong resistance; much neutrophilosis and much leukocytosis testify to severe infection but good defense; much neutrophilosis and slight leukocytosis, severe infection and low resisting powers. Any increase in the numbers of neutrophils with decrease of leukocytes is a sign of increasing gravity of the infection and reduction of the organic defenses. The larger the relative proportion of neutrophils, the greater the probability of pus production. None of his patients with neutrophilosis of 94½ per cent. recovered.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

December 2, 1916, II, No. 23, pp. 1985-2060

114 *Ringworm of the Beard. (Trichophyton rosaceum.) D. Muijs.—p. 1985.
115 *Why the Deaf Hear Better in Railroad Trains, etc. (Beter hooren in lawaai.) H. Burger.—p. 1992.

114. **Ringworm of the Beard.**—Muijs comments on the prevalence at Amsterdam of lesions in the beard for which the *Trichophyton rosaceum* is responsible. He gives a colored plate showing its growth on a culture medium of 4 per cent. peptone. He also tabulates the varieties of ringworm as published at Paris, Berlin, London and elsewhere. He has encountered fifty-six cases at Amsterdam in which this trichophyton was found in the beard. One man returned later bringing his son with beginning ringworm of the scalp, and two daughters with ringworm of the skin. This trichophyton was found in all. He also detected it in nine other cases, six of the scalp, two of the skin and one of the nails—a total of sixty-five cases. Five cases of this same ringworm of the beard have been reported at Paris, three at Parma, one at Hamburg and two at London—a total of sixty-seven in which the *Trychophyton rosaceum* has been found.

115. **Why the Deaf Hear Better in Railroad Trains.**—Burger argues that the deaf do not really hear better in the midst of noises, as is often assumed. Those with normal hearing hear so much less under these conditions that the hearing capacity of the more or less deaf profits in comparison. This suggests that it is improved by the racket, when in fact merely a lowering of the standard of hearing is responsible for the difference.

Hospitalstidende, Copenhagen

December 6, 1916, LIX, No. 49, pp. 1181-1204

116 Experimental Research on Suture of Bronchi and Drainage of the Pleura. F. Nielsen.—p. 1181. Concluded in No. 50.
117 *Fibrositis in the Legs. (Fibrositis extremitatum inferiorum.) P. Lorenzen.—p. 1193.

117. **Fibrositis in the Legs.**—Lorenzen has encountered comparatively frequently a typical clinical picture caused by infiltration of the connective tissue in the feet and also in the legs. The tenderness and pain may interfere with the use of the leg. The symptoms may resemble those from severe arteriosclerosis in the region. The pains are increased by functioning, and they may spread upward even beyond the legs, and there may be tonic contractions. In children and young people, functional disturbances predominate, either as a weakness or altered pose of the foot, with chilliness and sweating of the foot and other motor disturbances. The fibrositis may be palpated not only at the point of greatest tenderness but elsewhere on that leg and sometimes on both. The almost invariable valgus position of the big toe, or hammer toe, suggests that these deformities are always traceable to some form of this fibrositis. The frequent association with flatfoot is also suggestive of a causal connection.

The fibrositis may affect persons of all ages, and it is often mistaken for rheumatism, gout, varices, or merely flatfoot disturbance. Treatment applied on these mistaken premises is futile, while prompt recovery is the rule under local palpation and exercise of the tendons and muscles involved. A history of prolonged exposure of the feet to cold or dampness or overuse, alone or in combination, can usually be elicited. One of his child patients had been going barefoot during a long period of damp, bleak weather. A constitutional predisposition to nervous and joint troubles was more or less manifest in every case. Only a few had been relieved by heat and warmth, or by some special attitude of the foot. The infiltration can be palpated at various points in the foot, as he describes in detail, mostly along the flexor brevis digitorum or the extensor tendons of the big toe. Peritendinitis is the rule, and these changes can be traced for some distance. A few times he found a diffuse chronic swelling running around the foot, the ankle and lower part of the leg. The fibrositis may extend to the knee, and the veins are often varicose. There may be pain on pressure of the veins, but it can be traced to the tender muscle below. Sometimes distinct nodules can be felt on the sole, below the tuberosity of the calcaneum. Fibrositis in the neck, shoulders, arms and lumbar regions is more common, but even here it is liable to be erroneously diagnosed and treated.